This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Administrative Bulletins of the University of California

1920–21. No. 1

ORGANIZATION OF THE UNIVERSITY

The University of California is an integral part of the public educational system of the State. As such it completes the work begun in the public schools. Through aid from the State and the United States, and by private gifts, it furnishes instruction in literature and in science, and in the professions of engineering, art, law, medicine, dentistry, and pharmacy. In the Colleges of Letters and Science, Commerce, Agriculture, Mechanics, Mining, Civil Engineering, and Chemistry these privileges are offered without charge for tuition to all residents of California who are qualified for admission. Non-residents of California are charged a tuition fee of $10 each half-year. In the professional colleges, except that of Law, tuition fees are charged. The instruction in all the colleges is open to all qualified persons, without distinction of sex. The Constitution of the State provides for the perpetuation of the University, with all its departments.

CIRCULARS OF INFORMATION

Letters of inquiry concerning the College of Agriculture should be addressed to the *Dean of the College of Agriculture, Berkeley, California.*

For the following circulars of information concerning the several colleges and departments of the University apply to the *Mailing Division, President's Office, University of California, Berkeley, California.*

The Circular of Information, Academic Departments (Colleges of Letters and Science, Agriculture, Commerce, and Engineering, and the first two years of Medicine). Containing general information about the University, its organization, government, requirements for admission to undergraduate status, requirements for degrees, expenses, and abridged announcements of courses of instruction. Price, 10 cents. Sent by mail by the *Mailing Division, President's Office,* for 15 cents. Detailed information is given in the other publications mentioned in this list.

The Annual Announcement of Courses of Instruction in the Academic Departments. Price, 15 cents. Sent by mail by the *Mailing Division, President's Office,* for 20 cents.

The Announcement of the Graduate Division.

The Annual Commencement Programme. Containing the list of degrees conferred, scholarships, prizes, and other honors.

(*Continued on third page of cover*)

Digitized by Google

UNIVERSITY OF CALIFORNIA

ANNOUNCEMENT

OF

COURSES OF INSTRUCTION

COLLEGES OF LETTERS AND SCIENCE, COMMERCE, AGRICULTURE, ENGINEERING AND CHEMISTRY; SCHOOLS OF ARCHITECTURE, EDUCATION, AND JURISPRUDENCE.

FOR THE ACADEMIC YEAR, 1920-21

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY
1920

Digitized by Google

Digitized by Google

EXPLANATORY NOTE

CLASSIFICATION OF COURSES

I. UNDERGRADUATE COURSES.

1. *Lower Division Courses.*
2. *Upper Division Courses.*

An upper division course is an advanced course in a department of study that has been pursued in the lower division, or of elementary work in a subject of such difficulty as to require the maturity of upper division students. All upper division courses are definitely announced as such, and are given the numbers 100–199, as is explained below.

II. GRADUATE COURSES.

NUMBERING OF COURSES

Excepting only the upper division courses, *all undergraduate courses* are numbered from 1 to 99, inclusive.

Undergraduate upper division courses are numbered from 100 to 199, inclusive.

Graduate courses are numbered from 200 to 299, inclusive.

Teachers' courses are numbered 300, 301, etc. Such courses may be classified either as upper division courses or as graduate courses; however, if offered for the master's degree such courses are rated as upper division courses, not as graduate courses. For information concerning teachers' recommendations see the Announcement of the School of Education.

Year courses; double numbers. A course designated by a double number (for example, History 4A–4B) is continued through two successive half-years, that is, from August to May, or from January to December. The student will use the first number in registering for the course during its first half-year, and the second number during its second half-year. A final report will be made by the instructor at the end of each half-year; "provisional midyear reports" in year courses have been discontinued. The student may discontinue the course at the end of the first half-year, with final credit for the first half of the course, except as otherwise noted.

ABBREVIATIONS

The credit value of each course in semester units is indicated for each semester by a numeral in parentheses following the title. A semester unit is one hour of the student's time at the University, weekly, during one half-year, in lecture or recitation, together with the time necessary in preparation therefor; or a longer time in laboratory or other exercises not requiring preparation. The session during which the course is given is shown as follows: I, first half-year; II, second half-year; "Yr.", throughout the year. When no hours are stated it is understood that these are to be arranged later. Further information concerning class hours will be found in the SCHEDULE AND DIRECTORY.

PREREQUISITES

With reference to major subjects in the College of Letters and Science, the statement of requirements and recommendations under "Preparation for the Major" is addressed rather to the student who desires to be well prepared to complete a full undergraduate major—possibly as a candidate for honors—than to the student who wishes merely to satisfy minimum graduation requirements.

Digitized by Google

Digitized by Google

COURSES OF INSTRUCTION OFFERED IN THE COLLEGES AT BERKELEY FOR THE ACADEMIC YEAR, 1920-21

AGRICULTURE

*Thomas F. Hunt, D.Agr., Sc.D., Professor of Agriculture and Dean of of the College of Agriculture.

Edward J. Wickson, M.A., Professor of Horticulture, Emeritus.

Walter Mulford, F.E., Professor of Forestry and Director of Resident Instruction; Acting Dean of the College of Agriculture.

Clarence M. Haring, D.V.M., Professor of Veterinary Science and Director of Agricultural Experiment Station .

Bertram H. Crocheron, M.S.A., Professor of Agricultural Extension and Director of Agricultural Extension.

Hubert E. Van Norman, B.S., Professor of Dairy Management, Vice-Director of Agricultural Experiment Station, and Dean of University Farm School, Davis.

Myer E. Jaffa, M.S., Professor of Nutrition.

Charles W. Woodworth, M.S., Professor of Entomology.

*Ralph E. Smith, B.S., Professor of Plant Pathology.

J. Eliot Coit, Ph.D., Professor of Citriculture (resigned September 30, 1920).

Charles F. Shaw, B.S., Professor of Soil Technology.

John W. Gregg, B.S., Professor of Floriculture and Landscape Gardening.

John W. Gilmore, M.S., Professor of Agronomy.

Frederic T. Bioletti, M.S., Professor of Viticulture.

Warren T. Clarke, B.S., Professor of Agricultural Extension.

John S. Burd, B.S., Professor of Agricultural Chemistry.

Charles B. Lipman, Ph.D., Professor of Soil Chemistry and Bacteriology.

Ernest B. Babcock, M.S., Professor of Genetics.

*Gordon H. True, B.S., Professor of Animal Husbandry, Davis.

James T. Barrett, Ph.D., Professor of Plant Pathology, Acting Director of the Citrus Experiment Station, and Acting Dean of the Graduate School of Tropical Agriculture, Riverside.

†Fritz W. Woll, Ph.D., Professor of Animal Nutrition, Davis.

Walter P. Kelley, Ph.D., Professor of Agricultural Chemistry in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

²David T. Mason, M.F., Professor of Forestry.

---

* Absent on leave, 1920–21; † from July 1 to October 31, 1920;

² in residence second half-year only, 1920–21.

Digitized by Google

HENRY J. QUAYLE, M.S., Professor of Entomology in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

ELWOOD MEAD, D.Eng., Professor of Rural Institutions.

HOWARD S. REED, Ph.D., Professor of Plant Physiology in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

FRANK ADAMS, M.A., Professor of Irrigation Investigations.

CHESTER L. ROADHOUSE, D.V.M., Professor of Dairy Industry, Davis.

LEON D. BATCHELOR, Ph.D., Professor of Orchard Management in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

HOWARD S. FAWCETT, Ph.D., Professor of Plant Pathology in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

JOHN C. WHITTEN, Ph.D., Professor of Pomology.

WALTER L. HOWARD, Ph.D., Professor of Pomology, Mountain View.

RICHARD L. ADAMS, M.S., Professor of Farm Management.

WILLIAM T. HORNE, B.S., Associate Professor of Plant Pathology.

ERWIN J. LEA, M.S., Associate Professor of Nutrition.

WILLIAM B. HERMS, M.A., Associate Professor of Parasitology.

JOHN E. DOUGHERTY, B.S., Associate Professor of Poultry Husbandry, Davis.

GEORGE H. HART, M.D., D.V.M., Associate Professor of Veterinary Science.

PATRICK B. KENNEDY, Ph.D., Associate Professor of Agronomy.

SAMUEL H. BECKETT, B.S., Associate Professor of Irrigation Practice, Davis.

FREDERICK L. GRIFFIN, M.S., Associate Professor of Agricultural Education.

JACOB TRAUM, D.V.M., Associate Professor of Veterinary Science.

JAMES W. NELSON, B.S., Associate Professor of Agricultural Extension.

DENNIS R. HOAGLAND, M.S., Associate Professor of Agricultural Chemistry.

T. FRANCIS HUNT, B.S., Associate Professor of Agricultural Extension.

CHESTER W. RUBEL, B.S.A., Associate Professor of Agricultural Extension.

DONALD BRUCE, M.F., Associate Professor of Forestry.

FRED M. HAYES, D.V.M., Associate Professor of Veterinary Science, Davis.

WILLIAM R. CAMP, Ph.D., Associate Professor of Rural Institutions.

ROBERT F. MILLER, B.S., Associate Professor of Animal Husbandry, Davis.

BEN A. MADSON, B.S.A., Assistant Professor of Agronomy.

WILLIAM V. CRUESS, B.S., Assistant Professor of Fruit Products.

O. J. KERN, Assistant Professor of Agricultural Education.

HARRIET G. EDDY, A.B., Assistant Professor of Agricultural Extension.

LEROY B. SMITH, B.S., Assistant Professor of Agricultural Extension.

ROLAND S. VAILE, A.B., Assistant Professor of Orchard Management in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

Digitized by Google

WOODBRIDGE METCALF, M.S., Assistant Professor of Forestry.
ELIZABETH H. SMITH, M.S., Assistant Professor of Plant Pathology.
EDWIN C. VAN DYKE, M.D., Assistant Professor of Entomology.
WILLIAM F. GERICKE, M.S., Assistant Professor of Soil Chemistry.
ALFRED SMITH, M.A., Assistant Professor of Soil Technology, Davis.
ROY E. CLAUSEN, Ph.D., Assistant Professor of Genetics.
EDWARD O. ESSIG, M.S., Assistant Professor of Entomology.
VIRGIL C. BRYANT, M.S., Assistant Professor of Agricultural Extension.
EDWIN C. VOORHIES, B.S., Assistant Professor of Animal Husbandry and Assistant to the Dean.
GEORGE W. HENDRY, B.S., Assistant Professor of Agronomy, Davis.
ARTHUR H. HENDRICKSON, B.S., Assistant Professor of Pomology.
WARREN P. TUFTS, M.S., Assistant Professor of Pomology, Davis.
PAUL L. HIBBARD, B.S., Assistant Professor of Agricultural Chemistry.
WILLIAM W. MACKIE, M.S., Assistant Professor of Agronomy.
THOMAS TAVERNETTI, B.S., Assistant Professor of Farm Practice and Assistant to the Dean, University Farm School, Davis.
WALTER W. WEIR, Assistant Professor of Soil Technology.
FRANK J. VEIHMEYER, C.E., Assistant Professor of Irrigation Investigations.
FRIEDRICH C. H. FLOSSFEDER, Assistant Professor of Viticulture and Superintendent of Grounds at University Farm, Davis.
EARLE L. OVERHOLSER, M.A., Assistant Professor of Pomology.
STANLEY B. FREEBORN, B.S., Assistant Professor of Entomology.
CLIFFORD F. ELWOOD, B.S., Assistant Professor of Agricultural Extension.
WYLIE E. LLOYD, B.S., Assistant Professor of Poultry Husbandry, Davis.
LEONARD J. FLETCHER, B.S., Assistant Professor of Agricultural Engineering, Davis.
SAMUEL H. DADISMAN, M.S, Assistant Professor of Agricultural Education.
EMANUEL FRITZ, B.S., Assistant Professor of Forestry.
H. J. BAADE, B.S., Assistant Professor of Agricultural Extension.
ROY M. HAGEN, B.S., Assistant Professor of Agricultural Extension.
BURLE J. JONES, B.S., Assistant Professor of Agricultural Extension.
MARCUS A. W. LEE, B.S., Assistant Professor of Agricultural Extension.
CHARLES S. MYSZKA, M.S., Assistant Professor of Agricultural Extension.
PARKER TALBOT, B.S., Assistant Professor of Agricultural Extension.
H. A. WEINLAND, B.S., Assistant Professor of Agricultural Extension.
C. M. CONNER, B.S., Assistant Professor of Agricultural Extension.
J. F. WILSON, B.S., Assistant Professor of Animal Husbandry, Davis.
A. R. C. HAAS, Ph.D., Assistant Professor of Plant Physiology in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.
ARTHUR H. HOFFMAN, E.E., Assistant Professor of Agricultural Engineering, Davis.

Digitized by Google

ELBERT T. BARTHOLOMEW, Assistant Professor of Plant Pathology in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

FRANK W. ALLEN, M.S., Assistant Professor of Pomology, Davis.

JOHN P. BENSON, B.S., Assistant Professor of Agricultural Extension.

MAY SECREST, B.S., Assistant Professor of Agricultural Extension.

GROVER D. TURNBOW, B.S.A., Assistant Professor of Dairy Industry, Davis.

W. R. RALSTON, B.S., Specialist in Agricultural Extension.

ROBERT W. HODGSON, M.S., Specialist in Agricultural Extension.

JOSEPH F. GRASS, B.S., Specialist in Agricultural Extension.

A. A. JUNGERMANN, B.S., Specialist in Agricultural Extension.

THOMAS C. MAYHEW, B.S., Specialist in Agricultural Extension.

H. E. WAHLBERG, B.S., Specialist in Agricultural Extension.

H. L. WASHBURN, B.S., Specialist in Agricultural Extension.

GEORGE A. COLEMAN, M.A., Instructor in Entomology.

HUBERT L. BELTON, Teacher at the University Farm, Davis.

ROSS C. INGRIM, Teacher at the University Farm, Davis.

DANIEL H. CAREY, B.S., Teacher at the University Farm, Davis.

HENRY H. SEVERIN, Ph.D., Instructor in Entomology.

J. RAYMOND BEACH, D.V.M., Instructor in Veterinary Science, Davis.

ELMER R. DE ONG, B.S., Instructor in Entomology.

GUY L. PHILP, B.S., Instructor in Pomology, Davis.

ARTHUR W. CHRISTIE, M.S., Instructor in Fruit Products.

JULIUS L. COLLINS, B.S., Instructor in Genetics.

J. C. MARTIN, B.S., Instructor in Agricultural Chemistry.

C. L. FLINT, B.S., Instructor in Landscape Gardening and Floriculture.

H. M. BUTTERFIELD, M.S., Correspondence Teacher in Agricultural Education.

W. H. DORE, B.S., Instructor in Agricultural Chemistry.

GEORGE A. LINHART, Ph.D., Research Associate in Soil Chemistry and Bacteriology.

FRANCIS E. NEER, B.S., Instructor in Pomology, Davis.

HAROLD A. WADSWORTH, B.S., Instructor in Irrigation Investigations, Davis.

WALTER S. WILKINSON, B.S., Instructor in Agronomy, Davis.

G. H. WILSON, B.S., Instructor in Animal Husbandry, Davis.

JAMES P. BENNETT, Ph.D., Instructor in Pomology.

ALVA R. DAVIS, Ph.D., Instructor in Soil Chemistry and Bacteriology.

CLAYTON O. SMITH, M.S., Research Associate in Plant Pathology in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

HOWARD B. FROST, Ph.D., Research Associate in Plant Breeding in the Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

KATHERINE JONES, B.S., Associate in Landscape Gardening and Floriculture.

Digitized by Google

J. C. MARQUARDT, B.S.A., Associate in Dairy Industry, Davis.

E. E. THOMAS, Research Associate in Agricultural Chemistry in Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

RALPH BENTON, M.S., Correspondence Teacher in Agricultural Education.

DANIEL T. BATCHELDER, B.S., Associate in Animal Husbandry, Davis.

F. F. JANNEY, B.S., Farm Superintendent and Teacher at University Farm.

BLYTHE F. MONROE, B.S., Assistant in Soil Technology.

LEON BONNET, I.A., Assistant in Viticulture.

MELVILLE E. WANK, B.S., Assistant in Soil Technology.

JOHN C. JOHNSTON, B.S., Assistant in Citriculture.

STANLEY W. COSBY, B.S., Assistant in Soil Technology.

F. F. HALMA, Assistant in Plant Physiology in Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

HUGH KNIGHT, Assistant in Entomology in Citrus Experiment Station and Graduate School of Tropical Agriculture, Riverside.

HAROLD GOSS, B.S., Assistant in Nutrition.

Upper Division Courses.—All upper division courses announced by this department presuppose at least junior standing in the College of Agriculture. Students in other colleges may elect such courses in the department of agriculture as they are qualified to pursue.

Honors.—Students who become candidates for the bachelor's degree may be recommended for honors on the basis of the quality of the work done in the regular curriculum of the senior year or its equivalent, or on the basis of a thesis showing ability to do original work.

Graduate Work.—Students who intend to become candidates for ihgher degrees in the College of Agriculture will be required to give evidence of the completion of an amount of work equivalent, in its value, to that required by this college for its degree of Bachelor of Science. The student is referred to the Announcement of the Graduate Division for details of work in the sub-departments or divisions of this department.

AGRICULTURAL CHEMISTRY

A deposit of $10 is required in courses 2, 101, 102, 103; $5 of this is retained and the balance after deducting for breakage or loss may be returned.

1. General Agricultural Chemistry. (3) I. Tu Th S, 9. BURD
   Prerequisite: Chemistry 1A–1B.
   The relation of chemistry to agriculture.

2. Agricultural Laboratory. (2) I. BURD, MARTIN, ——
   Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4.
   Prerequisite: Chemistry 1A–1B. Students in the College of Agriculture will ordinarily take courses 1 and 2 concurrently.
   Experiments with and laboratory tests of agricultural materials.

Digitized by Google

101. Agricultural Biochemistry. (3) I. HOAGLAND, DORE
Lectures to be arranged. Laboratory, Tu Th, 1–4. Prerequisite: Chemistry 5 or 6A–6B and 8 (6A–6B recommended; may be taken concurrently).

Organic constituents of plants; fats and lipoids, proteins and enzymes, carbohydrates, with special attention to cellulose bodies; principles of plant metabolism from chemical point of view.

102. Agricultural Analysis. (3) II. HIBBARD
Lectures to be arranged. Laboratory, Tu Th, 2–5. Prerequisite: Chemistry 5 or 6A–6B; Agricultural Chemistry 1A–1B advised.

A technical course in the examination and evaluation of waters, fertilizers and insecticides; with special attention to interpretation of results and their application.

103. Laboratory Study of Selected Topics. Either half-year. HOAGLAND
Hours and credits to be arranged.

201. Research and Seminar in Agricultural Chemistry. The STAFF

AGRICULTURAL EDUCATION

Senior standing is prerequisite to courses 106, 108, 110, 112.

100. Elements of Agricultural Nature Study and Gardening. KERN
(3) II. Lectures, M Tu, 1; laboratory, W, 1–4.

A course for prospective supervisors of gardening and nature study. Aims, methods and materials used in agricultural instruction in the elementary school, with a suggested course of study. Outlines and discussions in the home garden and vegetable growing projects. The school garden as a laboratory for teaching certain processes. Garden practice and lesson plans. Illustrated lectures and readings.

106. Methods in Teaching Vocational Agriculture. (3) II.
GRIFFIN, DADISMAN

The technique of classroom teaching, laboratory instruction and project supervision. The individual as well as the group method of instruction and supervision are considered.

108. Methods in Teaching the Supplemental Vocational Subjects. (3 or more) II. GRIFFIN, DADISMAN

The purpose, materials and methods to be utilized in teaching the subjects supplemental to the applied work in secondary vocational courses in agriculture as outlined in the California plan for vocational education.

110. Organization, Supervision and Administration of Vocational Agriculture. (2) II. GRIFFIN

The problems relating to the organization, administration and supervision of vocational agriculture most frequently encountered by state supervisors, high school principals and vocational teachers form the basis of this course. Special consideration is given to the California plan of vocational education.

Digitized by Google

112. Principles and Methods of Agricultural Extension. (2 or 3) II.
GRIFFIN and others

Agricultural Extension agencies and their relation to rural community development. The origin and development of the County Farm Bureau; its purpose, organization and methods. The County Farm Advisors, Home Demonstration Agents and Agricultural Club leaders; their functions and methods. Farmers' Institutes, Extension Schools and other Extension agencies; their function and methods. Visual methods of instruction; principles and methods involved in the making and use of lantern slides, charts and moving pictures. Lectures, informal discussions, reports on assigned reading and laboratory work. The laboratory work, requiring one double period weekly, is opetional.

115. Selected Topics. Either half-year. GRIFFIN, KERN

This course offers senior students in any department of the University an opportunity to study systematically some problems of individual interest that pertain to agricultural education and country life.

202. Special Studies in Agricultural Education. GRIFFIN
Either half-year.

299. Thesis for the Master's Degree.

300. Practice of Teaching Vocational Agriculture. (4).
GRIFFIN, DADISMAN

A six weeks' practice course in selected California high schools. The observation of classroom teaching and project supervision; supervised practice teaching in the classroom, laboratory and field. By special arrangement with the department of education in the University this course will be accepted in satisfaction of the requirement in practice teaching for the high school teacher's recommendation.

(*Given at Davis*)

107A–107B. The Farm Project. (No credit) Yr. DADISMAN

Students whose major is agricultural education may undertake one or more projects in connection with their other class work at the University Farm. The work is on a commercially productive basis and is carried on under expert supervision. All of the work necessary for completing a project can usually be done outside of the usual class hours. To be taken during the junior year.

AGRONOMY

1. Agronomy. (3) I. M W F, 9. GILMORE

The fundamental factors of field crop production. Climate and crop geography, soil and moisture relationships, fertility and its maintenance, and the leading field crops with the principles of their culture and management, will be the principal topics presented. Lectures, recitations and demonstrations.

99. Practice. (Credit to be arranged.) GILMORE

Methods of crop production and farm management, with practical work. Trips into the country. Also special assignments. Six weeks, daily except Sunday, during the period of the Intersession.

Digitized by Google

106. Cereals. (3) I. Lectures, W F, 9; laboratory, W, 1–4. MADSON
Prerequisite: Soil Technology 1.

A study of the cereals of America, their morphology, culture, methods of improvement and uses. Lectures, assigned readings and laboratory practice.

108. Agrostology. (3) II. Lect. W F, 9; lab. Th, 2–5. KENNEDY
Prerequisite: Botany 5.

Morphology and taxonomy of grasses in their relation to agriculture.

120. Miscellaneous Crops. (3) II. M W F, 10. MADSON
Prerequisites: Soil Technology 1 and Botany 5.

A study of miscellaneous field crops including tubers, beans, sugar crop, fiber crops, etc., their morphology, culture, methods of improvement and uses. Lectures, assigned readings and problems.

125. Market Grades of Grain. (3) II. M W, 9; W, 1–4. MADSON
Prerequisite: Agronomy 106.

Lecture and laboratory exercises on the market classes and grades of grain, and the laws and regulations governing the same.

130. Conference. (1) I. W, 2–4. GILMORE and STAFF

Presentation of reports and papers with discussions on subjects assigned. Open to seniors only.

131A–131B. Special Topics. (1–2) Yr. GILMORE and STAFF

Study of literature with laboratory or field investigations on problems assigned.

200. Advanced Agronomy. Either half-year. GILMORE and STAFF

Original investigation of problems in crop production.

299. Thesis for the Master's Degree. GILMORE and STAFF

Subject, distribution of work and hours to be arranged.

(*Given at Davis*)

106. Cereals. (3) I. Lect. M, 11, Tu, 8; lab. M, 2–5. MADSON
Prerequisite: Soil Technology 1.

A study of the cereals of America, their morphology, culture methods of improvement and uses. Lectures, assigned readings and laboratory practice.

107. Forage Crops. (3) II. Lect. M, 11, Tu, 8; lab. M, 2–5. KENNEDY
Prerequisite: Botany 5.

The plants which produce feed for live stock; their characteristics, adaptations and culture methods; the principles underlying the maintenance of meadows, pastures and ranges.

Digitized by Google

ANIMAL HUSBANDRY

(*Given at Berkeley*)

*1. The Livestock Industry. (3) I. M W F, 8. VOORHIES

Statistical survey of the animal industry of this state and country. Relation of livestock to agriculture. Pure-bred industry of the Pacific Coast, and a general discussion of breeds of livestock and their management.

(*Given at Davis*)

99. Practice in Animal Husbandry. (6). VOORHIES

100. Farm Animals. (3) I. TRUE

A general course more advanced than course 1, with special emphasis on production.

101. Management. (4) II. MILLER, WILSON

The general care, feeding and management of hogs, sheep and horses. Two lectures and two laboratory or practice periods.

102. Feeding Farm Animals. (3) I. MILLER

A study of feeds generally used in livestock production. Underlying principles of feeding, balancing of rations, etc.

105. Judging of Dairy Cattle and Hogs. (4) II. ——

A study of the origin, history and development of the breeds. Two lectures and two practice periods.

106. Judging of Beef Cattle, Horses, Sheep. (4) I. MILLER

A study of the origin, history and development of the breeds. Lecture and practice periods.

107. Breeding Farm Animals. (3) II. WILSON

A study of the fundamental principles underlying animal breeding, with special emphasis on the more practical phases of the work.

108. Milk Production. (3) II. DOUGHERTY

Feeding and management of the dairy herd, with special emphasis on the economic problems connected with milk production.

109. Pro-seminar. (1) I. MILLER

110. Pro-seminar. (1) II. MILLER, WOLL

CITRICULTURE

99. Traveling Practice Course. (6). COIT, JOHNSTON

A six-weeks' practice course beginning at the end of the second half-year.

101. Citrus Fruits. (4) II. WHITTEN, JOHNSTON

Lectures, Tu Th S, 11; laboratory, Tu, 2–5.

Propagation, location and management of orchards, orchard heating, harvesting, packing, storing, marketing and pest control.

* Not to be given in 1920–21.

Digitized by Google

102. Semi-tropical Fruits. (4) I. WHITTEN, JOHNSTON
Lectures, Tu Th S, 11; laboratory, Tu, 2–5.

Semi-tropical fruits grown in California, including the date, fig, olive, avocado, pomegranate, loquat, persimmon, guava, feijoa, mango and others.

*103. Pro-seminar. (2) Either half-year. M, 3–5. COIT

Assigned special topics requiring extended research into pomological literature; reports and discussions.

*106. Applied Phases of Plant Physiology. (3) II. JOHNSTON
Lecture, M, 2; laboratory, W F, 2–5.

201A–201B. Research. Yr. COIT

299. Thesis for the Master's Degree. COIT

DAIRY INDUSTRY

99. Practice in Dairying.

Dairy manufactures, market milk and dairy production may be taken at the University Farm in the Creamery, or at the dairy barns, or in any creamery, milk plant or dairy farm approved by the division. May be taken after the sophomore or junior years. Credit given only when taken at the University Farm.

(*Given at Davis*)

Course 102 is prerequisite to courses 104, 128 and 130.

102. Principles of Dairying. (3) I. ROADHOUSE
Laboratory deposit $3.

The secretion of milk; nature, composition and value of milk and dairy products; principles and application of the Babcock tests; principles in the manufacture of dairy products; state dairy laws and a study of California dairy conditions.

104. Cheese-making. (3) II. MARQUARDT
Lecture, M Th, 10; laboratory, Tu, 1–5.

Instruction and practice in the manufacture of Cheddar, California (Granular), Jack, Cottage and Neufchatel cheeses. Organization and management of cheese factories.

128. Butter-making. (3) II. TURNBOW
Lectures, M, 1, Tu, 9; laboratory, F, 1–4.

The principles and practice of factory butter-making including cure of cream, cream grading and ripening, pasturizing, starter making, churning, moisture and salt control, packing and storing of butter, creamery organization, equipment and management.

130. City Milk Supply and Dairy Inspection. (3) II. ROADHOUSE
Lectures, W F, 10; laboratory, Th, 1–4.

Conditions affecting quality of milk for direct consumption; requisites for producing different grades of milk; tests for quality, adulteration, etc.; pasteurizing, standardizing, cooling and bottling milk for distribution; preparation of culture milk and the inspection and scoring of dairies, milk plants, milk and cream.

* Not to be given in 1920–21.

Digitized by Google

131. Testing Dairy Products. (2) II. W, 1–5. MARQUARDT
Laboratory deposit $3.

Technical test to determine composition of milk, cream, butter, cheese, ice cream, condensed and evaporated milk, casein and such other tests as are used in commercial manufacturing plants.

134. Ice Cream, Ices and Milk Specialties. (3) II.
Lectures, Tu Th, 9; laboratory, Th, 1–4. TURNBOW, MARQUARDT

Care, preparation, and mixing of the ingredients used in the manufacture of ice cream and ices; freezing, hardening and storing ice cream; the utilization of skim milk, buttermilk and whey; the principles involved in the manufacture of condensed milk, powdered milk, milk sugar, casein and albumin.

140. Seminar in Dairy Industry. (1) II. The STAFF
Biweekly reports and papers with discussion of subjects assigned.

ENTOMOLOGY AND PARASITOLOGY

1. General Entomology. (3) I. VAN DYKE
Lectures, Tu Th, 10; laboratory: Sec. 1, Tu, 1–3; Sec. 2, Th, 1–3.

Elements of insect structure, physiology and classification.

6. Parasites. (3) I. FREEBORN
Lectures, Tu Th, 10; section meeting by arrangement.

Origin and development of parasitism, classification and elementary relation of animal parasites to diseases of man and domestic animals.

27. Ecology. (3) II. M W F, 10. HERMS

Fundamental principles of ecology; animal communities; insect behavior.

99. Practice in Entomology and Parasitology. (6). The STAFF
Summer field course.

103A–103B. Special Problems. (2–4) Either half-year. The STAFF
Open to upper division students only.

105. Apiculture. (3) II. COLEMAN
Biology and handling of bees.

112. Insect Taxonomy. (3) Either half-year. VAN DYKE
Prerequisite: Entomology 1. May be repeated without duplication of credit.

The classification of insects.

114. Forest Entomology. (3) I. Lectures and laboratory. VAN DYKE
Insects affecting forest and shade trees.

116. Veterinary Parasitology. (4) I. HERMS, FREEBORN
Lectures, M W, 3; laboratory, M W, 1–3.
Prerequisites: Zoology 1A and Bacteriology 1.

Animal parasites affecting domesticated animals.

Digitized by Google

124. Horticultural Entomology (4) I. ESSIG
Lectures, M W, 4; laboratory, M W, 1–4.

Life histories, habits and control of insects attacking deciduous, citrus and tropical fruit trees, nuts, and vines in California.

*125. Field and Truck Crop Insects. (4) II. SEVERIN
Life histories, habits and control of insects affecting field and truck crops. Lectures and laboratory.

126. Medical Parasitology. (5) II. HERMS, FREEBORN
Lectures, M W Th, 3; laboratory, M W, 1–3.
Prerequisites: Zoology 1A and Bacteriology 1.

Animal parasites in relation to human disease.

129A–129B. Undergraduate Thesis Course. (2–5). The STAFF
Either or both half-years.

Open only to senior students electing entomology or parasitology as a major.

130. Rural Sanitation. (3) I. M W F, 10. HERMS
Disposal of farm sewage; prevention of filth diseases; sanitation of farm water supplies; control of mosquitoes and malaria; fly and rodent control; camp sanitation, etc.

200A–200B. Seminar in Entomology and Parasitology. (1–1).
Either or both half-years.

Required of all students enrolled in courses 129A–129B, 201A–201B and 299.

201A–201B. Research in Entomology and Parasitology. The STAFF

299. Thesis for the Master's Degree.

FARM MANAGEMENT

118. Farm Management. (3) I. Lect. W F, 10; lab. F, 1–4. ADAMS
Prerequisite: senior standing in the College of Agriculture; open by special permission to juniors. Recommended to juniors who are to take Farm Management 119.

The business aspects of land management. The relations of capital, choice of land, farm equipment, farm layout, cropping systems, labor, farm accounts and marketing to agriculture.

119. Farm Management. (2) I. Lect. and lab. M, 1–5. ADAMS
Prerequisite: senior standing in the College of Agriculture; to be preceded or accompanied by Farm Management 118.

Advanced lectures, laboratory and special projects supplementing Farm Management 118. Application of farm management principles to specific problems.

199. Undergraduate Thesis. ADAMS
Original investigation of farm management subjects.

200. Graduate Work in Farm Management. Yr. ADAMS
Individual research. Prerequisite: graduate standing in the College of Agriculture; training equivalent to Farm Management 118.

* Not to be given in 1921.

Digitized by Google

FARM MECHANICS

(*Given at Davis*)

2. Farm Building Construction. (2). Either half-year. BELTON

The use and care of tools, elements of carpentry, concrete construction and estimating of cost, together with the actual construction of various farm buildings, and appliances.

3. Forge Practice. (2). Either half-year. INGRIM

The principles and practice of general blacksmithing as applied to farm machinery.

101. Farm Machinery and Farm Motors. (4) II. FLETCHER

Economics of farm machinery; materials of construction. The development, construction, functions, adjustment, operation and repair of farm machinery. The production and transmission of power. Principles of draft. The study of gasoline and oil engines; electric power; tractors. Laboratory work in the study, operation and adjustment of the machines discussed in the classroom.

103. Gas Engines and Tractors. (4) I. FLETCHER

Two lectures, two laboratory periods weekly.

A study of the construction, operation and repair of gas engines and tractors. The laboratory work consists of the examination and operation of engines and tractors; trouble finding, repair work and field operating.

104. Farm Mechanics. (3) II. FLETCHER

Two lectures, one laboratory period weekly.

The mechanics of machines, transmission of power, soldering, babbitting, pipe fitting and use of tools used in machinery repair. Study of centrifugal pumps, farm water supply systems and independent electric lighting plants.

105. Farm Structures. (3) II. FLETCHER

Two lectures, one laboratory period weekly.

Location of buildings on the farmstead, essentials of farm buildings together with details of equipment and construction. Practice in designing and constructing.

FORESTRY

*1. Elementary Forestry Principles. (3) II. MULFORD

Lectures, M W F, 9; and one weekly quiz section by arrangement.

The relation of forestry to the every-day life of a nation; the influence of forests upon water supply, climate, soil and public health; the products of the forest. The life story of the tree and the forest; general principles of forestry practice, protection of the forest from fire and other enemies; present organization of forestry work in the United States and Europe. Several lectures on fish and game will be given by Dr. H. C. Bryant of the California Fish and Game Commission.

* Not to be given, 1920–1921.

Digitized by Google

*2. Elementary Forestry Practice. (3) I. METCALF
Lectures, M W, 10; laboratory, Th, 1–4.

A course for the land owner, ranch manager and others interested in practical forestry. Simple methods of planting, tending, measuring and utilizing trees. How to know important native and introduced trees; tree seed and how seedlings are grown in nurseries; the recognition and correct use of important commercial woods; prevention of decay in wood; measurement and valuation of standing timber.

10. Forest Mensuration. (3) II. BRUCE
Lectures, Tu Th, 10; laboratory, F, 2–5.

The measurement of saw logs and other manufactured products, of standing timber, and of the growth of trees and stands.

20. Forest Protection. (3) II. Lect. Tu Th, 8; lab. Th, 1–4. MASON
The protection of forests from fire, insects, fungi, trespass, etc.

99. Practice in Forestry. (6). BRUCE in charge, MASON, METCALF, FRITZ

Thirteen weeks, summer camp. To be held at Meadow Valley, near Quincy, in the Plumas National Forest. Prerequisite: Civil Engineering 1A–1B and Forestry 10. Practice in scaling and estimating timber and the study of its growth; timber survey of a large tract; detailed study of logging and milling operations; the location of logging railroads; grazing; collection of data for a working plan.

Woodsmanship.

While in camp for course 99 instruction in woodsmanship will be given. Students who make forestry their major subject will be required to become reasonably proficient in woodsmanship. No credit.

104. Silviculture: Forest Ecology and Natural Reproduction. (5) I.
Lectures, Tu Th F S, 8; field work, S, 9–12. METCALF

The influence of site on the forest and of the forest on site; the behavior of trees as members of a forest community; forest description; methods of reproducing the forests without planting or sowing; the care of the crop during its growth; timber sale marking.

106. Silviculture: Forestation. (2) I. METCALF
Lecture, M, 8; laboratory, Tu, 1–4.

Tree seeds; direct seeding; the forest nursery; forest planting; woodlot and windbreak planting; fixation of sand dunes.

108. Timber Trees and Forest Regions. (3) I. METCALF
Lectures, W F, 9; laboratory, M, 1–5.

Brief survey of the forest regions of the world; detailed account of the forest regions of the United States and Canada; the distribution, importance and silvical characteristics of the leading timber trees of the United States and Canada, and their identification.

112. Forest Utilization. (3) I. Lect. Tu Th, 10; lab. W, 1–4. FRITZ

The manufacture, seasoning, grading and care of rough and finished lumber; the principal industrial uses of lumber; minor wood-using industries; utilization of products other than wood, such as forage, fish and game.

* Not to be given, 1920–1921.

Digitized by Google

114. Wood Technology. (3) I. Lect. M W, 10; lab. F, 1–4. FRITZ
Identification of economic woods; physical, chemical and mechanical properties of wood; chemical utilization of waste; technical forest products; wood preservation; paper pulp; distillation of wood.

115. Logging. (3) II. Lectures, Tu Th, 9; laboratory, M, 1–4. BRUCE
The manufacture and transportation of saw logs from stump to mill.

118. Forest Engineering. (3) II. BRUCE
Lectures, M W, 11; laboratory, Tu, 1–4.
The construction and maintenance of forest trails, roads, bridges and telephone lines.

120. Forest Finance and Organization. (3) II. MASON
Lectures, M W, 8; conference, W, 1–4.
Forest finance, including compound interest in forest calculations; appraisal of timber and forest soil; damages; taxation; timber bonds; timber insurance; regulation of timber cut; working plans.

122. Forest Administration and Policy. (3) II. MASON
Lectures, Tu Th, 11; conference, S, 9–12.
Administration of the national forests and of state and private forests; forest policy; historical development of forestry.

124. The Lumber Industry. (3) II. Lectures, M W F, 10. MASON
Economics of the lumber industry; history and present status; personnel; finances; marketing; associations; wholesale and retail lumber business.

128. Conference. (1–3). Either half-year. The STAFF
Round table discussions of forestry problems; individual topics of study will be assigned. May be repeated without duplication of credit. Open only to students with a major in Forestry.

202A–202B. Research. Yr. The STAFF
Individual advanced study and research in silviculture, forest management, forest engineering, forest utilization; wood technology, forest protection, or forest policy.

GENETICS

1. Principles of Breeding Plants and Animals. (3) II.
BABCOCK, CLAUSEN, COLLINS
Lectures, M W, 9; recitations: Secs. 1, 2, Tu, 9; Secs. 3, 4, W, 8; Secs. 5, 6, F, 9. Prerequisite: Botany 3 and Zoology 1A.
Study of variation and heredity with reference to plant and animal improvement.

120. Special Topics. (3–5). BABCOCK, CLAUSEN, COLLINS
Either half-year.
Individual study, the results to be embodied in a report or thesis. Laboratory and practice work, with reading. Weekly meetings with reports. Lectures and laboratory exercises will be provided for students desiring formal instruction. With instructor's permission may be repeated without duplication of credit.

200. Research. BABCOCK, CLAUSEN, COLLINS

299. Thesis for the Master's Degree.

Digitized by Google

IRRIGATION PRACTICE

(*Given at Davis*)

120. Irrigation Practice. (3) II. BECKETT
Lecture, F, 11; field work: Sec. 1, Tu W, 2–5; Sec. 2, Th F, 8–11. Prerequisite: Irrigation 113, Civil Engineering 1A or 1E.

121. Special Problems in Irrigation Practice. (3) II. BECKETT
Open to students who are taking or who have taken course 120.
The preparation of land and application of water to various crops; the rates of application, rate of flow of water over the land, and distribution of moisture in the soil following irrigation.

LANDSCAPE GARDENING AND FLORICULTURE

99A. Practice in Landscape Gardening. (6). GREGG, JONES, FLINT
Summer course.
A general survey of the art of landscape gardening. Required of all students with a major in landscape gardening at the end of the junior year.

99B. Practice in Floriculture. (6). Summer course. FLINT
A general survey of the field of commercial floriculture; may be modified to meet the needs of individual students. Required of all students with a major in floriculture at the end of the junior year.

101. The Ornamentation of Home Grounds. (2) I. M W, 10. FLINT
The principles of design as applied to home grounds, together with the correct use of the best plant materials for such areas. Lectures, assigned readings, and reports.

102A–102B. Commercial Floriculture. (4–4) Yr. FLINT
Lectures, M W F, 1; laboratory, Tu, 2–5. Fee, $2.50.
The growing of the principal florists' crops on a commercial scale, both under glass and in the field. Lectures, reports, greenhouse and field work.

103. The Theory and Aesthetics of Landscape Design. (4) I. GREGG
Lectures, M W F, 9; drafting, W, 2–5.
The differing styles of landscape art and the principles governing correct design. Open to students whose major is architecture or engineering.

104A–104B. Plant Materials. (2–2) Yr. JONES
The form, habit, texture and adaptation of trees, shrubs, vines and herbaceous plants with reference to their value and use in landscape design.

104C–104D. Plant Materials. (2–2) Yr. JONES
Advanced study of plant adaptation and landscape value.

105A–105B. Elementary Landscape Design. (4–4) Yr. FLINT
Lecture, M, 1; drafting sections to be arranged.
The simpler problems of design with special reference to small areas, their reconstruction and improvement, from paced, chain and plane table surveys, together with reports, estimates and sketches.

Digitized by Google

106A–106B. Advanced Landscape Design. (4–4) Yr. GREGG

The more advanced problems of design and reconstruction from topographic and transit surveys as offered by the larger areas of parks, playgrounds and country estates, with detailed plans, reports and estimates.

107. History and Literature. (2) II. M F, 1. JONES

The history and literature of landscape gardening with special reference to early influences as they govern modern design.

108. Tree Surgery. (3) I. FLINT

Lectures, W, 2; laboratory to be arranged. Fee, $1.

The most approved methods of caring for ornamental trees; the technical details of planting, pruning and spraying, bolting, chaining and cavity work; shade tree legislation and duties of shade tree commissions and tree wardens.

109. Home Floriculture. (2) II. FLINT

Lectures, Tu Th, 11; laboratory, Tu, 2–5. Fee, $2.50.

The propagation and culture of the more common annuals, herbaceous perennials and bulbous plants grown in California gardens; the preparation of soils and the planting of flower beds; the use of fertilizers and the preparation and application of spraying materials. Lectures, assigned reading, garden and greenhouse work.

201. Modern Civic Art. (8) I. GREGG

Advanced problems in design with special reference to city parks, municipal park systems, recreation areas, civic centers and other civic features, as they form an intimate part of the city plan as a whole. Consultation, outside reading, and the preparation of plans, specifications, estimates and reports.

202A–202B. City and Town Planning. (8–8) Yr. GREGG

Advanced problems in planning and designing. The economic and aesthetic problems involved in the systematic planning and development of American cities. The progress of all phases of city and town planning in this and European countries is made the basis of lectures and outside reading. Extensive practice projects are outlined and plans and specifications prepared for the development of new cities and towns and the replanning of others for their best economic and aesthetic development.

299. Thesis for Master's Degree. The STAFF

NUTRITION

Laboratory deposit of $10 required in courses 109, 117, 119, 127, 129, 231; $5 returnable less deductions for breakage.

2. Pure Food and Drug Laws and their Operation. (2) I. M W, 8. LEA

The history of food legislation; critical discussion of national, state and municipal laws on food inspection and control; the use of preservatives; adulteration and misbranding of foods; human foods and those for cattle and poultry. Lectures and recitations.

Digitized by Google

99. Summer Course. Practice in Nutrition. JAFFA

Arrangement for practice course requirements for students whose major is nutrition may be made by consultation with the head of the division.

106. Feeds and Feeding. (3) I. JAFFA, GOSS

Lectures, Tu Th, 1; laboratory by arrangement.
Prerequisite: inorganic chemistry.

The composition and use of cattle and poultry foods; compounding of rations; practical application of the principles of animal nutrition to the rational feeding of farm animals. Lectures, recitations and laboratory work.

109. Laboratory Course in Dairy Chemistry. (3–4) I. GOSS

Prerequisite: Chemistry 5.

Quantitative chemical and microscopical methods for examination of milk, butter, other dairy products and commercial milk foods, for the detection of preservatives and adulterants. Lectures and laboratory exercises.

114. Fundamentals of Nutrition. (2) I. Tu Th, 2. JAFFA

Prerequisite: inorganic chemistry.

Designed to give the general student some knowledge of the nature and functions of food, and the mechanism involved in its digestion and utilization.

116. Foods and Food Products. (2) II. Tu Th, 2. JAFFA

Prerequisite: inorganic chemistry; organic chemistry recommended.

A detailed study of food materials, their physiological values and economic importance. Discussion of standards and dietaries.

117. Laboratory Course in Food Analysis. (3–4) Either half-year. GOSS

Prerequisite: Chemistry 5.

Quantitative chemical and microscopical methods for examination and analysis of foods, and methods for detection of adulteration. Nature of the materials studied will depend upon the interest and preference of the student. Opportunities for advanced work may be offered.

119. Advanced Course in Food Chemistry. (3) II. LEA, GOSS

Laboratory, M W, 1–4; lecture to be arranged.
Prerequisite: Course 117 or Agricultural Chemistry 101.

A critical study of methods for determining the purity and quality of food products with special reference to the requirements of food and drug laws.

120. Pro-seminar in Nutrition. (2) II. JAFFA

A critical study of the methods of feeding large groups and a discussion of the problems involved in the management of the commissary departments of institutions, industrial and agricultural organizations, camps, etc.

Digitized by Google

126. Advanced Nutrition. (3) I. ——
Prerequisites: Chemistry 1A–1B, 8; Physiology, and Agricultural Chemistry 101 recommended.
The chemistry and physiology of alimentation and a detailed study of the processes of metabolism involved in the nutrition and growth of animals.

127. Laboratory Course in Advanced Nutrition. (3) I. ——
Prerequisites: Chemistry 1A–1B, 5, 8; Physiology, and Agricultural Chemistry 101 recommended. Designed to accompany course 126.
A study of digestion and metabolism, with practice in nutrition experiments on animals and man.

129. Problems in Nutrition and Food Chemistry. JAFFA and The STAFF
Either half-year. Thesis work may be included.

230. Seminar in Foods and Nutrition. (2) I. JAFFA
Discussion of recent work in food chemistry and feeding experiments with the interpretation of laboratory results. Nutritional aspects of the processes of manufacturing and preserving foods.

231. Research in Food Chemistry and in Nutrition. JAFFA

232. Seminar in Nutrition and Metabolism. (1) II. ——
Discussion of original papers in recent journals as a stimulus to further investigation.

299. Thesis for the Master's Degree.

OLERICULTURE

(*Given at Davis*)

103. Vegetable Gardening. (3) I. CAREY, JENKINS
One lecture and one laboratory or field period weekly.
General principles of vegetable gardening; detailed directions for the production and marketing of vegetables under California conditions.

104. Vegetable Crops. (3) II. CAREY, JENKINS
Two lectures and one laboratory or field period.
The production and preparation for market of special vegetables and vegetable seed crops.

PLANT PATHOLOGY

99. Practice Course. HORNE
Students with a major in plant pathology should register for this course not later than the middle of the junior year or after completing course 120. The course may be given either during the college year or in vacation, according to the material available and the circumstances of the individual student. The work will consist mainly in trips to various parts of California, where the student may make field studies upon the nature, economic importance and practical control of representative plant diseases. Not required of students with a major in plant pathology who have completed Agronomy 99, Citriculture 99, Pomology 99 or Soil Technology 99.

Digitized by Google

120. Diseases Affecting Cultivated Plants in California. (4) I.
HORNE, E. H. SMITH
Lect. Tu Th, 8; laboratory: Sec. 1, Tu Th, 9–12; Sec. 2, Tu Th, 1–4.
Prerequisite: junior standing in the College of Agriculture or a reasonable equivalent.

Lectures and laboratory studies on diseases of economic plants. A beginning course required of juniors whose major is plant pathology, but intended also for other students who desire a general knowledge of the subject.

121. Special Undergraduate Study. II. HORNE
Prerequisite: course 120.

Laboratory work in continuation of course 120.

122A–122B. Advanced Course. (4–4) Yr. HORNE, E. H. SMITH
Lectures, M W, 8; laboratory, M W, 9–12.
Prerequisite: course 120 and Botany 105A.

The principles of plant pathology, nature of disease and the chief disease-inciting influences; disease-producing organisms, their development, activities and relation to host plants by means of microscopic, cultural, histological and infection methods. Systematic review of important diseases. Lectures, laboratory and collateral reading. Required of seniors whose major is plant pathology.

125A–125B. Special Topics. (2). Either half-year. The STAFF

Laboratory or field study of an assigned topic, with preparation of a thesis.

126A–126B. Pro-seminar. (1–1) Yr. The STAFF

Papers and discussions by members of the class on topics of interest in connection with the various courses. Required of all students whose major is plant pathology; open to other students enrolled in 121, 122A–122B, or 230.

230. Graduate Research. The STAFF
Original investigations of special problems.

299. Thesis for the Master's Degree.

POMOLOGY

1. General Horticulture. (3) II. M W F, 9. WHITTEN

A general introductory course in horticulture as a part of a farm system; culture and arrangement of fruits, vegetables and ornamental plants.

101. Principles and Practices of Fruit Growing. (3) I.
M W F, 10. OVERHOLSER, BIOLETTI

A study of the general principles and practices of deciduous fruit growing, propagation, planting and culture of orchard trees, small fruits and grapes; harvesting, storing and marketing fruits.

105A–105B. Pro-seminar. (2–2) Yr. M, 3–5. WHITTEN and The STAFF

Required of graduate students, but open to seniors specializing in pomology.

Digitized by Google

106. Systematic Pomology. (2) I. Tu Th, 1–4. OVERHOLSER, BIOLETTI

A study of species, groups and varieties of fruits, with emphasis upon their special purposes, requirements and adaptation. The course includes apricots, apples, cherries, grapes, nuts, pears, peaches, plums and small fruits. Considerable practice will be given in judging fruit and the interpretation of score cards. Observations will be made upon the behavior of fruits in cold storage.

107. Nuciculture. (2) II. Tu Th, 10. OVERHOLSER

Nut fruits, including the almond, walnut, pecan, chestnut, filbert and others. Classification, propagation, location and management of orchards, harvesting, marketing and utilization.

120. Physiology and Anatomy of Fruit Plants . (3) II. BENNETT
M W F, 9.

A study of the structure and functions of fruit plants as applied to practices and problems of fruit growing.

121. Advanced Pomology. (3) I. Tu Th S, 10. WHITTEN and The STAFF

A study of the sources of knowledge and opinions as to the principles and practices of pomology; methods and difficulties involved in pomological experimental work. An occasional laboratory or field trip may be arranged as a substitute for one or more lectures.

199. Special Topics and Problems. WHITTEN, OVERHOLSER, BENNETT

201. Research. WHITTEN, OVERHOLSER, BENNETT

299. Thesis for Advanced Degrees.

(*Given at Davis*)

99. Practice Course. PHILP, ALLEN

Six weeks' summer course beginning about July 1. Eight hours each day except Saturday, when only four hours will be required. Picking, grading, packing, drying and scoring of fruits. Orchard practice with the handling of such crops as apricots, peaches, pears and plums. Special emphasis will be laid on the requirements of the "green," cannery and dried fruit markets. As many visits as possible will be made to neighboring fruit districts in order to study commercial methods in the field. The work in the field will be supplemented by lectures and assigned readings dealing with the handling of California fruits.

101. General Pomology. (4) I. HENDRICKSON, PHILP
M W F, 10; F, 1–5:30. Identical in subject matter with course 101 as given at Berkeley with one additional laboratory period.

103. Orchard Practice. (3) II. W F, 1–5:30. PHILP, SEVIER

A laboratory course designed to give the student actual practice under orchard and field conditions in the various operations of deciduous fruit production; propagation, planting, pruning, spraying, etc.

Digitized by Google

POULTRY HUSBANDRY

(*Given at Davis*)

99. Practice in Poultry Husbandry. (6). DOUGHERTY, LLOYD

Practice in feeding and caring for pens of fowls, grinding and mixing feeds, caring for young chicks, running incubators, and all of the work necessary in the management of a poultry plant. Required of all students whose major is poultry husbandry.

101. Poultry Husbandry. (3) II. DOUGHERTY, LLOYD
Lectures, Th F, 11; laboratory, F, 2–5.

The feeding, housing, breeding and general management of poultry; study of the egg; anatomy and physiology of poultry; parasites and sanitation.

102. Poultry Management. (3) II. DOUGHERTY, LLOYD
Daily practice by arrangement.

A practice course in operating incubators, keeping records, hatching eggs, brooding chicks, feeding and caring for pens of fowls. Course 101 must precede or accompany this course.

104. Pro-seminar. (2) II. DOUGHERTY, LLOYD
Prequisite: courses 101 and 102.

Advanced study and discussion, including a review of literature.

105. Undergraduate Research. (1–3) II. DOUGHERTY, LLOYD
Prerequisite: courses 101 and 102; must be preceded or accompanied by course 104.

Original investigation of a problem in poultry husbandry, the results to be presented in a thesis.

RURAL INSTITUTIONS

101. Co-operative Marketing and Food Distribution. (3) I. CAMP
M W F, 8.

A study of rural and urban institutions and agencies for the distribution of products from and to the farm, including co-operative marketing and buying associations, farm bureau exchanges, country markets, auction markets, municipal markets and abattoirs, produce and grain exchanges, grain and cold storage warehouses, wholesale and retail stores. The purpose is to show the problem of sale and purchase by farmers through such agencies, the relative costs to producers and consumers of the different methods of marketing and purchase; and to consider reforms for regulating or directing the movement of farm products between producers and consumers, for eliminating the wastes of duplication in delivery, buildings and equipment, and for controlling the margins between producers and consumers.

102. Rural Credits and Land Settlement. (2) II. Tu Th, 10. MEAD

A study of the rural credit and land settlement policies needed to create organized rural communities and to make ownership of land by its cultivators a public policy. Lectures, readings and reports.

Digitized by Google

103. The Rural Community and Its Organization. (3) II. KERN
M Tu W, 9.

The social organization of rural communities. Origin, progress and chief characteristics of American rural society. Study of various phases of rural society in its community relations and agencies for the improvement of rural institutional life. Rural leadership in its relation to rural democracy and the problems of reconstruction. Classroom discussions, illustrated lectures, assigned readings and reports on special topics.

203. Research in Rural Institutions. I. MEAD
Prerequisite: courses 101, 102.

Open to qualified graduate students who desire to study organization of rural communities needed to make farm life more profitable and attractive and who desire to write a thesis or prepare for publication a paper on some question connected with these subjects.

204. Research in Distribution of Farm Products. CAMP
Either half-year.

Open to qualified students who wish to do field work in the problems of the distribution of special farm products.

SOIL CHEMISTRY AND BACTERIOLOGY

100. Important Features of Soil and Plant Interrelations. (2) II.
Tu Th, 11. LIPMAN

Lectures and recitations intended to clarify some of the modern views, methods and materials in plant physiology and soils science. Open to juniors and seniors in the College of Agriculture and in other technical scientific schools. Not open to those specializing in soil and plant investigations.

122A–122B. Interrelations of Plants and Soils. (4–4) Yr.
LIPMAN, GERICKE

Laboratory, M W F, 1–4, and one lecture period by arrangement. Prerequisite: Chemistry 5, Agricultural Chemistry 101. 122B may be taken without 122A.

Laboratory and greenhouse experiments designed to train plant physiologists and soil scientists. Soil chemistry and soil bacteriology included. Recitations in conjunction.

126A–126B. Pro-seminar in Soils. (1–1) Yr. LIPMAN

Discussion of papers on various topics of research in soils. Required of all students in courses 122A, 122B and 127.

127. Special Problems. Yr. LIPMAN

Undergraduate research in soils for senior theses or publications. Prerequisites on consultation with the instructor.

235. Research in Soils and their Relations with Plants. Yr. LIPMAN

Open to qualified graduate students who desire to carry on research in plant physiology or soils, looking toward the attainment of the doctor's degree or toward publication of technical papers. Prerequisites on consultation with the instructor in charge.

Digitized by Google

236. Seminar in Soils and their Relations with Plants. (1–1) Yr. GERICKE

Critical studies of advanced research in soils and plant physiology. Prerequisites: graduate standing in soils, plant physiology, chemistry, biochemistry or agricultural chemistry.

SOIL TECHNOLOGY

Laboratory Fees.—A laboratory deposit of $5 is required for course 1; of this $4, less deductions for breakage, is returnable.

1. Soil Technology. (4) II. SHAW, MONROE

Lectures and recitations, M W F, 10; laboratory: Sec. 1, M, 1–4; Sec. 2, W, 1–4; Sec. 3, F, 1–4. Prerequisite: Geology 1A, Chemistry 1A–1B.

The origin, formation and classification of soils; soil texture and structure and their relations; organic matter; soil moisture and its control; soil management.

99. Practice in Soil Surveying. (6). SHAW, A. SMITH

Prerequisite: Soil Technology 1.

A six weeks' study of the methods of classifying and mapping soils, consisting of practical field work in soil surveying, and the preparation of soil reports. The field work will be supplemented by an inspection trip covering a large part of the state.

101. Soils of the United States. (3) II. M W F, 9. SHAW, A. SMITH

Prerequisite: Soil Technology 1.

A study of the soils of the United States with special reference to their classification, character, management and utilization.

102A–102B. Soil Physics. (3–3) Yr. MONROE, SHAW

Laboratory, Tu Th, 1–4; one conference period by arrangement. Prerequisite: Soil Technology 1. May be repeated without duplication of credit.

A study of the physical composition of soils, soil structure, moisture relations and their modification.

103. Soils of California. (2) II. Tu Th, 9. SHAW, WEIR

Prerequisite: junior standing in the College of Agriculture; open to other students only by permission.

The classification, general character and present utilization of the soils of California, including a study of each of the important soil series occurring in the state.

200. Research. SHAW and The STAFF

299. Thesis for the Master's Degree. SHAW and The STAFF

Digitized by Google

VETERINARY SCIENCE

The courses offered are designed to supplement the instruction in animal husbandry, poultry husbandry, dairy industry, parasitology, hygiene and public health.

The instruction in veterinary science does not prepare for the practice of veterinary medicine.

(*Given at Davis*)

110. Elementary Anatomy and Physiology of Domestic Animals. (3) I. Two lectures, one laboratory period. HAYES

The digestive apparatus and digestion of food producing animals. Particular attention will be given to the anatomy and functioning of the reproductive organs of these animals and the bearing which this knowledge has on certain breeding difficulties, such as infectious abortion. A study of the bones and muscles and their relation to external conformation and judging of animals will be included.

101. Poultry Diseases. (2) II. Lectures and laboratory. BEACH

The anatomy and physiology of domesticated fowls and the nature and control of their diseases. Especial attention will be given to the diagnosis and control of infectious diseases.

111. Veterinary Science. (3) II. HAYES
Lectures, W, 8, Th, 9; laboratory, Th, 3–5, F, 1–5.

The more common diseases of horses, cattle, sheep and swine.

Veterinary Parasitology. (See Entomology 116.) FREEBORN

119. Undergraduate Thesis. Advanced Dairy Bacteriology.
Prerequisite: Bacteriology 1. HART, HAYES

Original study in special topics.

200. Research. HART, HAYES
Laboratory and field research on special topics.

299. Thesis for the Master's Degree.

VITICULTURE AND FRUIT PRODUCTS

99. Practice in Viticulture or Fruit Products. The STAFF

Six weeks' field work under an instructor for credit (6 units) or three months' work in vineyard or fruit products establishment without credit.

112. Fruit and Vegetable Products. (3) I. CRUESS, CHRISTIE
M W F, 8. Prerequisite: Chemistry 1A–1B and Bacteriology 1, or their equivalents.

Lectures on the principles and practice of preparation, preservation, and examination of such fruit and vegetable products as canned fruits and vegetables, dried fruits and vegetables, preserves, jellies, jams, vinegar, and denatured alcohol.

Digitized by Google

115. Fruit and Vegetable Products. (3) I. CRUESS, CHRISTIE
M W F, 1–4. Prerequisites: Chemistry 1A–1B and Bacteriology 1, or their equivalents. Viticulture and Fruit Products 112 should accompany this course.

Laboratory practice in preparation and examination of fruit and vegetable products; accompanied by several trips to nearby canneries, evaporators, and other food preservation establishments.

199. Undergraduate Investigation and Pro-seminar in Viticulture or Fruit Products. Either half-year. The STAFF

233. Graduate Research in Viticulture. Either half-year.
BIOLETTI, BONNET, FLOSSFEDER

237. Graduate Research in Fruit Products. Either half-year.
CRUESS, CHRISTIE

299. Thesis for the Master's Degree. Either half-year. The STAFF

(*Given at Davis*)

116A–116B. Viticulture. (5–5) Yr. BIOLETTI, BONNET
Prerequisite: junior or senior standing in the College of Agriculture.

Lectures accompanied by laboratory and field practice in the culture of raisin, table, and other grape varieties, the harvesting and packing of table and shipping grapes, and the drying of grapes.

Digitized by Google

ANATOMY

HERBERT MCLEAN EVANS, B.S., M.D., Professor of Anatomy.
ROBERT O. MOODY, B.S., M.D., Associate Professor of Anatomy.
VICTOR E. EMMEL, Ph.D., Associate Professor of Anatomy.
PHILIP E. SMITH, Ph.D., Assistant Professor of Anatomy.
KATHARINE J. SCOTT, A.B., M.D., Instructor in Anatomy.
MELVILLE L. MONTGOMERY, A.B., Assistant in Anatomy.
[1]THEODORE C. LAWSON, M.A., Assistant in Anatomy (to Dec. 31, 1920).

RALPH W. SWEET, Instructor in Anatomical Illustration.

The department is equipped for investigation in the fields of systematic anatomy, neurology, histology, and embryology. The equipment includes a library of the chief anatomical periodicals and monographic literature and special facilities for experimental work.

Laboratory fees for non-medical students are as follows: Courses 101, 102, 103, $5; 105, $15 for the entire course or $5 for each part. For the fees charged students in the Medical School, see the Announcement of the Medical School.

Microscopic Anatomy

101. Histology and Microscopic Organology. (6) I.
EVANS, SCOTT, MONTGOMERY

3 laboratory and 3 lecture periods a week. M W F, 8–12. Prerequisites: chemistry, physics and elementary biology (zoology, botany, or physiology).

The course is given from the viewpoint of the activities of the living cell, the relation between structure and function being held uppermost. At the same time opportunity is afforded for a comprehensive review of human and comparative histology. Individual loan collections supplement the laboratory work.

103. Organs of Special Sense and Neurology. (3) I. SMITH, SCOTT

August 17–October 5; 2 lectures and 3 laboratory periods a week. Tu Th S, 8–12.

In this course special attention is paid to the macroscopic and microscopic architecture of the central nervous system and the organs of special sense. The neuron studied in course 101 is used as the unit in the construction of the nervous system with a view of tracing origin, development, and final arrangement of the different pathways for nerve impulse. Considerable attention is given to a consideration of the growth and development of the nervous system.

---

[1] In residence first half-year only, 1920–21.

Digitized by Google

Systematic Human Anatomy

102. General Human Anatomy. (3) II. MOODY, ——
Demonstrations, Tu Th, 9; laboratory, W, 1–4. Prerequisite: Zoology 1A or Physiology 1.

A study of the human body. Demonstrations and laboratory study of prepared human dissections, models and microscopic slides. For students of public health and physical education. Other non-medical students may be admitted by arrangement with the instructor if size of class permits. Not open to freshmen.

105. Systematic Human Anatomy. (10) I.
MOODY, EMMEL, SMITH, LAWSON
Tu Th, 8–12; M Tu W Th F, 1–5.

The systematic dissection of the human body. For convenience the work is divided into thirds or "parts," to wit: Head and Neck, Arm and Thorax, Leg and Abdomen. To better facilitate instruction students in the Medical School are required to finish each part in accordance with a prescribed time schedule.

108. Regional and Topographical Anatomy. (3) I. MOODY
October 6–November 30; Sec. 1, M W, 8–12; Sec. II, Tu Th, 8–12.

Living models, special dissections and sections of the body are used in this course to enable the student to become more familiar with structural relations and to assemble information obtained in preceding dissections. Students who are accepted for course 213 may substitute that course for this course.

109. Anatomy for Physicians and Advanced Students. The STAFF
Either half-year.

120. Anatomical Draughtmanship and Illustration. (1–4) I. SWEET
S, 9–12 and other hours.

A course in anatomical draughtmanship open to medical students of the first and second years, art students, research workers and members of the faculty who desire to familiarize themselves with the best methods of graphic reproduction of gross and microscopic structures either as methods of record or for publication.

Electives

209. Human Embryology. Either half-year. EVANS

Opportunity is offered for the study of specific problems in human embryology. The collections of both human and comparative embryological material are constantly being augmented. The elective is offered only to students familiar with vertebrate embryology.

210. Physiological Anatomy of Reproduction. Either half-year. EVANS
1 hr. weekly.

Informal conferences and demonstrations. The oestrus cycle, implantation, comparative placentation, etc. Outside reading required.

Digitized by Google

211. Haematology. Either half-year. EMMEL

An intensive study of the blood and blood forming organs and their relation to current haematological problems. The subject includes the finer structures of the nuclear and cytoplasmic elements and their role in physiological reactions of the blood; cytomorphism and histogenesis as correlated with specialization of function; origin and localization in embryonic development; proliferation, regeneration and quantitative regulation with reference to normal and abnormal activities in the adult organism.

212. Experimental Embryology. II. SMITH

Conference and original work by the experimental method chiefly with amphibian material on problems of developmental mechanics.

213. Original Investigation. The STAFF

Hours optional. Either half-year.

Students and others who are prepared to undertake research in any of the anatomical sciences will be given facilities and encouragement by members of the staff. Time devoted by the majority of the second-year class to course 108 can be applied here by those specially qualified.

214. Topics will be discussed by the staff and those electing the course. Either half-year.

For the year 1920–1921 topics will be chosen from the field of physiological histology.

Digitized by Google

ANTHROPOLOGY

A. L. Kroeber, Ph.D., Professor of Anthropology and Curator of the Anthropological Museum.

T. T. Waterman, Ph.D., Associate Professor of Anthropology.

*Paul Radin, Ph.D., Assistant Professor of Anthropology.

*Edward W. Gifford, Associate Curator of the Anthropological Museum and Lecturer in Anthropology.

Leslie Spier, Ph.D., Associate Curator of the Anthropological Museum and Lecturer in Anthropology.

Paul-Louis Faye, B. ès L., LL.B., Teaching Fellow in Anthropology.

James C. Scott, A.B., Teaching Fellow in Anthropology.

Matthew W. Stirling, A.B. Teaching Fellow in Anthropology.

Preparation for the Major

Required: Anthropology 1a–1b. (8). The selection of upper division courses must include 103a–103b.

Lower Division Courses

1a. General Anthropology: Origin and Antiquity of Man. (4) I. M W F, 9, and weekly section meeting. The Staff

Man as an animal; heredity; races and race problems; earliest culture.

1b. General Anthropology: Origin and Development of Civilization. (4) II. M W F, 9, and weekly section meeting. The Staff

The source and growth of institutions, arts, customs, industries, language, and religion.

Upper Division Courses

103a. Ethnography of Oceania and Africa. (3) I. M W F, 3. Waterman

The native tribes and nations of Oceania and Africa. Lectures and conferences.

103b. Ethnography of Europe, Asia, America. (3) II. M W F, 3. Waterman

The peoples and cultures of Europe, Asia, and America.

104. Fossil Man. (3) II. M W F, 2. Waterman

Evolution as illustrated in the skeletal remains of early man and his fore-runners. Primitive life as shown by prehistoric implements and other remains.

---

* Absent on leave, 1920–21.

Digitized by Google

105. The North American Indians. (3) I. M W F, 9. SPIER
The native peoples and indigenous civilizations of America north of Mexico.

*115. Peoples of the Philippines. (3) II. M W F, 10. KROEBER
Black and brown races; pagan peoples; Hindu, Mohammedan, and Christian influences; East Indian relations; present status.

125. Social Origins. (3) II. M W F, 9. SPIER
The development of marriage, society, and government.

132. Anthropology of the Bible. (3) II. M W F, 10. KROEBER
The Old Testament as an historical document in the light of archaeology and anthropology.

137. Indians of California. (3) I. M W F, 10. KROEBER
Origin and relationships of the natives; prehistoric remains; shell mounds. Tribal divisions; arts; customs; industries; beliefs.

*138. Ancient Egypt. (3) II. M W F, 10. GIFFORD
The origin and relationships of the ancient Egyptians; the evolution of their arts, industries, religion, and society from the earliest times to the Arab conquest.

145. Indians of Mexico and Central America. (3) I. M W F, 2. WATERMAN
Ancient Aztec and Maya cities. Architecture, writing, calendar system, ceremonies, government, poetry, and art of the ancient and modern peoples.

199A–199B. Honors Course. (3–3) Yr. KROEBER
M W, 11, and an hour to be arranged.
Special problems by individual students, with credit of not less than 3 units.

GRADUATE COURSES

206A–206B. Seminar: Ethnography of the American Indian. (At least 3) Yr. Tu, 7:30–9:30 p. m. WATERMAN

207A–207B. Special Problems: Field Methods (at least 3) Yr. KROEBER
M W, 11.

299. Thesis for the Master's Degree.

* Not to be given in 1920–21.

Digitized by Google

ARCHITECTURE

JOHN G. HOWARD, Fellow in the American Institute of Architects, Professor of Architecture, and Director of the School of Architecture.

WILLIAM C. HAYS, B.S., Associate Professor of Architecture.

WARREN C. PERRY, B.S., Assistant Professor of Architecture.

M. EARL CUMMINGS, Assistant Professor of Modeling.

RAYMOND W. JEANS, M.A., Instructor in Water-Coloring and Pen and Ink Drawing.

WILLIAM E. LELAND, B.S., Lecturer in Architectural Mechanics.

PREPARATION FOR THE MAJOR

Required: Architecture 5 (2 units), 11 (3), 12 (2), 13 (2); Mathematics 3 (6), 4 (6); Graphic Art 14 (4); Drawing 3 (9); Physics 1 (6); Civil Engineering 8 (2).

Honors-Students in the Upper Division.—The student must have received honorable mention with the junior certificate, or, in case of seniors, have completed the junior work in architectural design with distinction.

1. Candidates for honors must be registered in the architectural curriculum as laid down in the Circular of Information.

2. At the beginning of each half-year each candidate will be required to submit his study-list to the chairman of the department for approval, and thereafter work in close touch with the various instructors, attending such conferences and making such reports as may be asked for.

3. Under the "value" system, as defined in the Circular of Information, honors-students will be encouraged to proceed to the more advanced work in design as they show fitness for it.

4. Honors in architecture require distinguished excellence in design and thoroughly satisfactory work in construction.

LOWER DIVISION COURSES

Courses 5A–5B, 5C–5D, 5E–5F are open to all students specially interested in architecture and as a free elective to upper division students.

Graphic Art 14 is prerequisite to the following: courses 12A–12B and 13A–13B.

*†5A–5B. History of Ancient and Classic Architecture. HOWARD

A general survey of the history of ancient and classic architecture, with an analytical study of its character, illustrated with lantern slides.

*†5C–5D. History of Mediaeval and Renaissance Architecture. HOWARD

The architecture of the Middle Ages and the Renaissance period, illustrated with lantern slides.

---

* Courses 5A–5B, 5C–5D will not be given in 1920–21.

† The full course in History of Architecture and Allied Arts (5A–5B, 5C–5D, 5E–5F) is covered in three years, the courses being given in succession, one each year.

Digitized by Google

†5E–5F. History of Modern Architecture and Allied Arts. (1–1) Yr. Tu, 2. HOWARD

A detailed study of modern architecture and allied arts, illustrated with lantern slides.

11. Classic Orders of Architecture. (3) II. PERRY
Prerequisite: Drawing 3A, 3B, 3C.

12A–12B. Water Color. (1–1) Yr. JEANS
Sec. 1, M, 1–4; Sec. 2, Th, 9–12.
Architectural rendering in water color.

13A–13B. Pen and Ink. (1–1) Yr. JEANS
Sec. 1, F, 1–4; Sec. 2, Th, 1–4.
Architectural subjects rendered in pen and ink.

14A–14B. Modeling. (1–1) Yr. CUMMINGS
Sec. 1, Tu, 8–11; Sec. 2, F, 8–11.
Modeling of architectural ornament.

NOTE.—Courses 12A–12B, 13A–13B, 14A–14B may be continued and additional credit received. Extra credit will also be allowed for additional work in these courses at the rate of one unit for each three-hour period.

UPPER DIVISION COURSES

Course 101 or 102 must accompany the following: courses 105A–105B, 105C–105D, 105E–105F.

101A–101B. Elements of Architecture. (3–3) Yr. PERRY
M, 4–6; W, 3–5. Prerequisite: course 11 and junior standing.
Elementary architectural design.

102A–102B. Planning. (5–4) Yr. HAYS
Prerequisite: course 101A–101B. Course 106C–106D must be taken concurrently.
Fundamental problems in planning.

*105A–105B. Historical Drawings in Ancient and Classic Architecture. (1–1) Yr. HOWARD, PERRY

*105C–105D. Historical Drawings in Mediaeval and Renaissance Architecture. (1–1) Yr. HOWARD, PERRY

105E–105F. Historical Drawings in Modern Architecture and the Allied Arts. (1–1) Yr. HOWARD, PERRY

106A–106B. Theory of Architecture. (1–1) Yr. PERRY
Pro-seminar, prescribed for students in course 101A–101B.

---

† The full course in History of Architecture and Allied Arts (5A–5B, 5C–5D, 5E–5F) is covered in three years, the courses being given in succession, one each year.

* Not to be given, 1920–21.

Digitized by Google

106C–106D. Theory of Architecture. (1–1) Yr. HAYS
Continuation of course 106A–106B. Pro-seminar, prescribed for students in course 102A–102B.

108A–108B. Architectural Mechanics. (3–3) Yr. M W F, 8. LELAND
Mechanical, electrical, and plumbing installation and equipment in relation to architecture. Sanitation. (*a*) Heating, ventilating, and power; (*b*) plumbing, sanitation, lighting, elevators, vacuum cleaning, automatic sprinklers, etc.

110. Housing. (1) II. Th,2. HAYS
Lectures on the house—isolated and collective: its historic and aesthetic development; its elements and their arrangements; its equipment.

GRADUATE COURSES

203A–203B. Planning and Composition. (8–8) Yr. HOWARD
Tu Th, 3–4:30. Prerequisite: course 102A–102B.
Problems in planning and composition.

204. Advanced Design. (15) I. HOWARD
Prerequisite: course 203A–203B.
Advanced problems in planning and composition.

206E–206F. Seminar in the Theory of Architecture. (1–1) Yr. HOWARD
Continuation of course 106C–106D. Prescribed for students in course 203A–203B.

209A–209B. Professional Practice and Business Relations. (3–2) Yr. HAYS
Prerequisite: course 102A–202B or 101A–101B and graduate standing.
Seminar in office practice, working drawings, specifications and ethics.

299A–299B. Research and Thesis for Master's Degree. (1–4) Yr. HOWARD
Course 203A–203B must be taken concurrently. Prerequisite: graduate standing and course 102A–102B.

216. Graduate Thesis and Seminar. HOWARD
Prerequisite: course 204.
A course to be arranged individually with students looking toward a degree in architecture.

COURSES IN OTHER DEPARTMENTS

Strength of Materials. (See Civil Engineering 118A–118B).

Materials of Engineering Construction. (See Civil Engineering 8.)

Framed Structures. (See Civil Engineering 107E–107F, 117.)

Life Drawing (Graphic Art 128A–128B).

Digitized by Google

ASTRONOMY

ARMIN O. LEUSCHNER, Ph.D., Sc.D., Professor of Astronomy and Director of the Students' Observatory.

RUSSELL T. CRAWFORD, Ph.D., Professor of Astronomy.

STURLA EINARSSON, Ph.D., Associate Professor of Practical Astronomy.

WILLIAM F. MEYER, Ph.D., Assistant Professor of Astrophysics.

FREDERICK C. LEONARD, M.S., Teaching Fellow in Astronomy.

RAYMOND H. SCIOBERETI, A.B., Teaching Fellow in Astronomy.

PREPARATION FOR THE MAJOR

Required: Plane trigonometry; Mathematics 5 (3), 9 (3); French or German; Physics 1A–1B.

Recommended: Astronomy 1, 2A, 5 and 11.

Honors-Students in the Upper Division.—The following courses are prerequisite to honors-work in the upper division: Mathematics, either 5, 8 and 9, or 3 and 4; Physics 1A–1B. In addition to these, Chemistry 1A and Geology 1A are recommended. A student in the honors-group may be recommended for honors in astronomy at graduation:

1. Upon presenting a satisfactory written report (review or criticism) of some astronomical work (theoretical or practical), an account of which has been printed in some standard astronomical periodical or other publication; or

2. Upon presenting a complete and satisfactory computation in orbit theory or eclipses; or

3. Upon presenting a complete report of some advanced practical work done by the student.

Candidates for honors must prepare a programme at the beginning of their candidacy in consultation with the member of the department designated to supervise their work. On approval of this plan of study the student will proceed to its completion, attending conferences and making such reports of progress as may be requested.

Honors-students will be allowed much freedom in their studies. To justify this, the work which they do must be consistently of high quality. The department will recommend the exclusion from the honors-group of all students who do not maintain each half-year an average of at least 60 per cent of first and second grades in all their courses and who do not complete their courses in astronomy with high credit. Candidates must fulfill the requirements for a major in astronomy and must enroll for Astronomy 206. (Although this course is listed as a graduate course, it may be taken by advanced undergraduates.) A reading knowledge of French and German is required.

Laboratory Fees.—An observatory fee of $2.50 per half-year is charged in courses 2A–2B, 104A–104B, 114, 117.

Digitized by Google

Lower Division Courses

1–2. Elementary Astronomy—Combination of Courses 1 and 2A. (5). Either half-year. Crawford
Lectures and section work as course 1; observatory work, course 2A.

1. Elementary Astronomy. (3). Either half-year. Crawford
M W F, 10.

An introductory course. General facts and principles underlying the science of astronomy in all its branches.

The classes will be divided into smaller sections in which recitations, examinations, and conferences will be conducted. In the second half-year a separate section, 2 hrs., will be conducted for students who have the equivalent of the entrance requirements in mathematics and physics for the colleges of engineering.

2A–2B. Practice in Observing. (1). Either half-year.
Meyer, Leonard, Sciobereti
Either half-year. In four sections. M Tu W Th, 7:15–10 p.m.

These courses are supplementary to course 1 or 11 or 103A–103B, and are open to students who are taking or have taken any of these courses. The students may enroll for from 1 or 2 units by electing 2A, or 2A and 2B.

2A. Practical work at the observatory for beginners, with special emphasis on the elementary methods of determining time, latitude, and longitude. Constellation study. Descriptive observations of celestial objects. 3 hrs., either half-year; 1 unit.

2B. Continuation of course 2A. 3 hrs., either half-year; 1 unit. Prerequisite: course 2A.

5. History of Astronomy. (3) I. M W F, 2. Crawford
Prerequisite: course 1.

11. Modern Astronomy. (3) II. M W F, 10. Einarsson
Prerequisite: course 1.

The stars and nebulae. Progress in astronomy through modern methods, especially spectroscopic and photographic.

Course Primarily for Engineers

3. Surveyors' Course in Elementary Practical Astronomy. (1) II.
Einarsson
Sec. 1, M, 1–4; Sec. 2, Tu, 1–4; Sec. 3, W, 1–4.
Prerequisite: Civil Engineering 1A. Civil Engineering 1B is to be taken concurrently.

The principles of spherical trigonometry and astronomy adapted to the needs of students in the colleges of engineering. Computing.

Upper Division Courses

A working knowledge of differential and integral calculus is prerequisite to courses 107 and 108.

Course 104A or 114 is prerequisite to courses 110 and 112.

Digitized by Google

103A–103B. General Astronomy. (3–3) Yr. M W F, 9. EINARSSON
Prerequisite: Mathematics 5 and Physics 1A–1B.

The general facts and principles underlying the science of astronomy in all its branches, developed and discussed in detail.

For observatory work in connection with this course students may elect course 2 or 104A–104B, subject to the prerequisites announced.

104A–104B. Practical Astronomy. (3–3) Yr. LEUSCHNER
Tu Th, 9; M, 7–10 p.m.

Prerequisite: Mathematics 5, Physics 1A–1B, and either course 1 or 103A.

Lectures and observatory work. Practical work at the observatory with sextant, clock, chronograph, transit-and-zenith telescope, equatorial telescope, photographic telescope, reflector, altazimuth instrument. Computing.

The course should also be preceded by a course in differential calculus.

105A–105B. Navigation and Nautical Astronomy. (3–3) Yr. EINARSSON
Tu Th, 11, and one observing period. Prerequisite: Mathematics C.

Astronomy as applied to navigation. Use of sextant, chronometer, compass, Nautical Almanac, nautical tables. Determination of time, latitude, and longitude on shipboard by the methods of Marq St. Hilaire, Aquino, and Johnson. Sailings. Great circle sailing. Deviationo f the compass.

107. Method of Least Squares. (2) I. M F, 1–4. EINARSSON

The fundamental principles and processes of the method of least squares and their application to the solution of astronomical, physical, and engineering problems.

108. Interpolation. (3) II. LEUSCHNER

The more useful formulae of interpolation, and their application in the use of astronomical and other tables. Development of the formulae of numerical differentiation and integration and their application in the construction of tables. Practice in extensive numerical computations, with special aim at rapidity and exactness.

*110. The Theory of Astronomical Refraction. (2) I.

*112. Eclipses. (3). Either half-year. CRAWFORD

116. Measurement and Reduction of Astronomical Photographs. (3 II. EINARSSON

117. Astrophysics. (3) II. MEYER
Tu Th, 10, and one laboratory period.

A general review of present-day problems in astrophysics with particular reference to the application of the spectroscope to their solution.

---

* Not to be given, 1920–21.

Digitized by Google

114. Practical Astronomy for Engineers. (3) I. EINARSSON
Tu Th, 9, and one observing period.
Prerequisite for students in the College of Civil Engineering: Astronomy 3 and Civil Engineering 3.

The subject matter of course 104 more briefly presented, and adapted to the needs of students of civil engineering. The observatory is open for this course two evenings and one afternoon. The arrangement of the work depends so largely upon weather conditions that the student should reserve for this course several observatory periods.

GRADUATE COURSES

Every graduate course may be taken as a seminar course by arrangement with the instructor.

Course 206 is prerequisite to courses 207 and 212A–212B.

206. Theoretical Astronomy. (3) I. LEUSCHNER
Prerequisite: course 1 or 103A; Mathematics 4 or 109A–109B; ordinarily also Physics 105A. Open to advanced undergraduates.

207. Theoretical Astronomy. (3) II. LEUSCHNER
The relative accuracy of the various methods of determining preliminary orbits.

208A–208B. Introduction to Celestial Mechanics. (3–3) Yr. LEUSCHNER
M W F, 9.

209. Special Perturbations. (3) I. CRAWFORD

*†210A–210B. The General Perturbations of the Minor Planets after Hansen, Newcomb, and Hill. CRAWFORD

†212A–212B. Satellite Theory and Introduction to the Lunar Theory. CRAWFORD

†213. Selected Topics in Celestial Mechanics. Either half-year. LEUSCHNER

214. Advanced Practical Astronomy. (3). Either half-year. EINARSSON
M W, 11; M, 7–10 p.m. Prerequisite: course 104A–104B.

215. Advanced Study and Research. (1). Either half-year. The STAFF
Critical discussion and review of current astronomical publications. Investigation of special problems to be selected according to the preparation and the needs of individual students.

299. Thesis for the Master's Degree. ——

---

* Not to be given, 1920–21.

† These courses form a series which the student can complete in about three years. From two to three of these courses are offered every half-year, the selection being based on the needs and the preparation of the graduate students in astronomy.

Digitized by Google

COURSES IN OTHER DEPARTMENTS

Spectroscopy. [See Physics 211.].	LEWIS
Railroad Surveying. [See Civil Engineering 102.]	FOOTE
Higher Surveying and Geodesy. [See Civil Engineering 105.]	FOOTE

LICK OBSERVATORY

The Lick Observatory at Mount Hamilton forms a separate department of the University. The unrivaled facilities for advanced astronomical work which are offered by its fine equipment, in this favorable location, are too well known to require description here. The department is open to graduate students under regulations prescribed by the Regents. The degrees of Master of Arts and Doctor of Philosophy are offered to students who have fulfilled the required conditions. (See Announcement of the Graduate Division.) For information relating to graduate work at the Observatory intending students should address the Recorder of the Faculties at Berkeley, or the Director of the Lick Observatory, at Mount Hamilton, Santa Clara County, California.

Digitized by Google

BIOCHEMISTRY AND PHARMACOLOGY

WALTER R. BLOOR, Ph.D., Professor of Biochemistry.
CARL L. A. SCHMIDT, Ph.D., Assistant Professor of Biochemistry.
EDWARD S. SUNDSTROEM, M.D., Instructor in Biochemistry.
GUY W. CLARK, Ph.D., Instructor in Pharmacology.
G. LEB. FOSTER, M.A., Associate in Biochemistry.
S. BRODY, M.A., Assistant.
—— ——, Assistant.

PREPARATION FOR THE MAJOR

Required: matriculation physics and chemistry; Chemistry 1 (10 units), 8 (3), 9 (3). For medical students, in addition to above, Zoology 1 (9). Recommended: Chemistry 5; German, Zoology 1, or Physiology.

For science and general students the prerequisites for the study of biochemistry are as follows: Matriculation physics and chemistry, Chemistry 1A–1B, 8 and 9. A course in biology, e.g., Zoology 1A–1B or Physiology, is desirable.

For medical students the prerequisites are as prescribed for the medical school. Courses 101 and 102M are required.

The attention of intending advanced students in biochemistry is called to the fact that modern developments in this field call increasingly for a good knowledge of physical chemistry, quantitative chemical methods and the ability to read French and German scientific literature.

The equipment of the department affords ample opportunities for research. Facilities are offered to any qualified student who desires to undertake a well planned investigation in the field of biochemistry.

The joint library of the departments of biochemistry and physiology contains complete sets of the more important biochemical, physiological and pharmacological journals and the more important books and monographs on biochemical and related subjects.

The division of Clinical Laboratories (U. C. Hospitals) is now included in the department of Biochemistry and Pharmacology, but no courses are given.

UPPER DIVISION COURSES

101. Biochemistry. (9) II.
BLOOR, SCHMIDT, SUNDSTROEM, FOSTER, and Assistants
Lectures, M Tu W Th, 1, F, 9; laboratory, M Tu W Th, 2–5.

A breakage deposit of $5 is required, in addition to a fee of $10 for materials used. For fees charged medical students see Medical School Announcement.

The lectures in this course consist of a brief discussion of the physico-chemical basis of life processes, a survey of those classes of substances which are to be found in animals and plants, a discussion

Digitized by Google

of the changes which these substances undergo during life and during utilization as food, and a general survey of the field of nutrition and energy exchange.

The laboratory practice is designed to acquaint the student with the more important constituents of living matter and their chemical behavior, and with some of the routine methods used in the study of processes in living animals, especially in man. This course fulfills the requirements in biochemistry of the Medical School. Lectures and laboratory work may be taken separately; see courses 103–104 below.

102M. Pharmacology and Materia Medica. (3) II.
CLARK and Assistants

Lectures, Tu Th, 12–1 (at the Medical School in San Francisco); laboratory and demonstrations, S, 8:20–12:30 (in the Physiology Building, Berkeley). Conferences to be arranged. The properties and physiological action of drugs with illustrations derived from their therapeutic application. Experiments and demonstrations. Open only to students matriculated in medicine.

103. Biochemistry. Lectures only. (5) II.
BLOOR, SCHMIDT, SUNDSTROEM, FOSTER

M Tu W Th, 1; F, 9; together with conference periods to be arranged.

104. Biochemistry. Laboratory only. (4) II.
BLOOR, SCHMIDT, SUNDSTROEM, FOSTER, and Assistants

Prerequisite: course 103, completed or in progress. M Tu W Th, 2–5; conference periods to be arranged. Fees and deposits as in 101.

110. Advanced Biochemistry. Either half-year.
BLOOR, SCHMIDT, SUNDSTROEM, FOSTER

Prerequisite: course 101 or its equivalent.

Special methods and preparations together with reading, intended to prepare the student for research.

111. Undergraduate Research. I or II. BLOOR, SCHMIDT, SUNDSTROEM

Prerequisites: courses 101 and 110.

A limited number of selected students will be given topics for investigative study under the direction of some member of the department.

112. Seminar. BLOOR

GRADUATE COURSES

210. Research in Biochemistry. Either half-year.
BLOOR, SCHMIDT, SUNDSTROEM

212. Seminar. BLOOR

299. Thesis for the Master's Degree.

Digitized by Google

BOTANY

WILLIAM A. SETCHELL, Ph.D., Professor of Botany.
WILLIS L. JEPSON, Ph.D., Professor of Botany.
THOMAS H. GOODSPEED, Ph.D., Associate Professor of Botany.
NATHANIEL L. GARDNER, Ph.D., Assistant Professor of Botany.
—— ——, Assistant Professor of Economic Botany.
TOWNSHEND S. BRANDEGEE, Ph.B., Honorary Curator in the Herbarium.
HARVEY M. HALL, Ph.D., Honorary Curator in the Herbarium.
HELEN BERGFRIED, M.A., Associate in Botany.
Six assistants.

PREPARATION FOR THE MAJOR

Required: Botany 2A, 2B (6).

Recommended: Chemistry 1A–1B, Physics 2A–2B, French, German.

Courses 2A, 2B are prerequisite to all upper division courses in botany. Lecture courses in the summer session may be equivalent to course 1 in part, and credit will not be given for both in such a case. Course 3 is also designed to fulfill lower division requirements in the College of Agriculture. Laboratory courses in the summer session may be equivalent to course 2A–2B; credit will not be given for duplicated work.

Courses 5, 104A–104B, and 105A are required for major subjects in certain divisions of the College of Agriculture.

Honors-students in the Upper Division.—Of the 24 units of upper division work required for graduation with honors, 16 units should consist of courses 104A–104B, 105A–105B, 109, 111, the remaining 8 units to be made up preferably from one of the more advanced courses in the department. In special cases, by permission of the chairman of the department, these 8 units may be taken in some allied department.

Honors-students will be given special opportunities as far as facilities will permit. These may consist of additional working room in the laboratories, of opportunities for herbarium, garden, or field work, or of additional individual attention and guidance from the instructor. If it seems advisable, an honors-student may after consultation with the instructor, substitute special field, laboratory, or garden studies for a part of the class work regularly required of other students.

For those students who expect to prepare for botanical research or teaching, a broad foundation in related subjects is strongly advised. The fundamental courses in physics and chemistry should be taken, if possible, before the work in botany is begun. Courses in physiology, zoology, and plant pathology may be included to advantage; higher mathematics is desirable; a reading knowledge of French and German is necessary; some knowledge of Latin is very desirable for advanced systematic botany.

Laboratory Fees.—A laboratory fee of $2.50 will be charged each half-year for each laboratory course. This rule applies to courses 2A, 2B, 3, 5, 104A–104B, 105A–105B, 106A–106B, 107A–107B, 109, 110, 111, 112A–112B, 113A–113B.

Digitized by Google

Lower Division Courses

1. Fundamentals of Botany. (3) I. M W F, 8. Setchell

Lectures, illustrated as far as possible by means of specimens, diagrams, and preparations; designed to set forth in a general way the most important facts, problems, and theories with which botanical science is concerned.

2A. General Botany. (4) I. Gardner and Assistants

Lectures, M W, 2; laboratory, Sec. 1, Tu Th, 8–10; Sec. 2, Tu Th, 10–12; Sec. 3, Tu Th, 1–3; Sec. 4, M W, 8–10.

Prescribed for certain students in home economics.

A combination lecture, laboratory, recitation, and field course comprising the fundamentals of morphology and physiology of flowers, fruits, seeds, seedlings, roots, stems and leaves, with special reference to food producing, fiber producing, and ornamental plants. Field trips on alternate Saturday mornings.

2B. General Botany. (4) II. Gardner and Assistants

Lectures, laboratory and field trips as in course 2A. Prerequisite: course 2A.

A continuation of course 2A, covering the lower orders of plants and an introduction to taxonomy of the flowering plants.

3. General Botany. (4) II.

(For students in the College of Agriculture only.)

4. Classification of Flowering Plants. (1) II. Jepson

S, 8; alt. S, 9–12.

Lectures on plant structure, considering especially those organs most important in classification; accompanied by field work and practical exercises in determining species by means of a manual.

5. Economic Botany. (3) I. Lect. M W, 8; lab. M W, 10–12. ——

Prerequisite: courses 2A, 2B; Chemistry 1A–1B.

Laboratory work on the morphology, classification, geographical distribution, and properties of plants which furnish commercial products and agricultural crops; lectures on the origin, collection, uses, and commerce of plant products.

Upper Division Courses

104A–104B. General Phaenogamic Botany. (3–3) Yr. Jepson

Tu Th, 1–4, with 3 hrs. field work to be arranged.

104A. Forest Botany.

Laboratory work on the botanical characters of forest trees and chaparral; practice in the determination of important California species; lectures on the classification of Gymnosperms and other groups, and on the essentials of morphology and physiology as applied to trees.

104B. Angiosperms.

Prerequisite: course 104A. Representative orders of flowering plants, dealing especially with their habits and growth, structure, classification, and geographical distribution. Laboratory work and lectures.

Digitized by Google

105A–105B. General Cryptogamic Botany. (3–3) Yr. SETCHELL
Laboratory and lectures, M F, 1–4. May be taken either half-year by qualified students.

The orders of spore-bearing plants from the points of view of structure, development, and economic importance. Laboratory work and informal lectures.

106A–106B. Phycology and Mycology. (3–3) Yr. SETCHELL
M W F, 1–4. Prerequisite: course 105A–105B.

Laboratory work upon the structure, development, and classification of the algae, fungi, and lichens, with informal lectures and the assignment of outside reading. Intended for students who desire some critical knowledge of the lower cryptogamous orders.

107A–107B. Pteridology and Bryology. (3–3) Yr. SETCHELL
M W F, 1–4. Prerequisite: course 105A–105B.

The structure, development, and classification of the higher cryptogams (hepatics, mosses, ferns, and fern allies) will be treated in the same way as the lower cryptogams in course 106A–106B.

109. Vegetable Histology. (4) I. Tu Th alt. S, 9–12. GOODSPEED
A study of the microscopical anatomy of the higher plants with reference to function and the influence of environment. There will be included practice in those methods of botanical microtechnique which have to do with the preparation of woody tissues—cutting and staining of freehand sections, the celloidin method, microchemical tests.

110. Botanical Microtechnique. (1) I. S, 9–12. GOODSPEED
Practice in the cutting and staining of freehand sections; the celloidin method; the Venetian turpentine method; the paraffin method, including embedding, the use of the microtome and staining on the slide.

111. Vegetable Cytology. (4) I. Tu Th, 1–4; alt. S, 9–12. GOODSPEED
The anatomy and physiology of the cell, including cell division, chromosome reduction and fertilization. There will be included practice in embedding, use of the microtome, and staining on the slide.

112A–112B. Special Taxonomic Studies. (3–3) Yr. JEPSON
Tu Th, 9–12; field work, alt. S, 8–5. Prerequisite: course 104A–104B.
Studies in the special morphology of important natural orders, mainly from the taxonomic standpoint, followed by the critical examination of various West American genera. Students of agronomy, landscape gardening, forestry, genetics or other divisions are here offered opportunity for taxonomic study of the plant group in which their interest is primarily agricultural.

113A–113B. Taxonomy and Phylogeny of the Phaenogams. (3–3) Yr. JEPSON
M W, 9–12; field work to be arranged. Prerequisite: courses 104A–104B and 105A–105B.

Characters and affinities of the classes and more important orders of seed plants, accompanied by informal discussions of phylogenetic problems. It is desirable that at least part of the summer in the year previous to the election of this course should be spent in field work, preferably in California.

Digitized by Google

Graduate Courses

The equipment of the botanical department is fairly complete, permitting a wide range of studies. It includes the following collections:

(1) A phaenogamic herbarium of 185,000 sheets of mounted specimens and a large quantity of unmounted material which is available for use by responsible investigators. The flora of Western America is here better represented than in any other collection, which permits of satisfactory work in preparing revisions or monographs of these plants. The economic section contains representatives of the more common cultivated plants, particularly of those grown in California.

(2) A cryptogamic herbarium consisting of 25,000 mounted sheets. The representation of the west coast algae is undoubtedly the most complete in existence. These collections, together with the ease with which the marine forms may be collected, render the study of cryptogams, and particularly of algae, very satisfactory.

(3) A botanical museum containing valuable sections of woods, barks, cones, etc., available for class and research work.

(4) A botanical garden where native plants are grown and where cultural experiments may be carried on by qualified students.

225A–225B. Advanced Cryptogamic Botany. Yr. M W, 10–12. Setchell
Advanced and research work on the cryptogamic plants of California, particularly on the algae.

226A–226B. Advanced Phaenogamic Botany. Yr. M W, 1–4. Jepson
Special problems requiring the original investigation of some particular order or smaller group of flowering plants; involves work in the field as well as in the laboratory.

227A–227B. Advanced Vegetable Histology and Cytology. Yr. Goodspeed
M W F, 1–5.
Special problems in vegetable histology and cytology will be assigned to properly prepared students.

228A–228B. Advanced Plant Physiology. Yr. M W F, 1–5. Goodspeed
Special problems in plant physiology will be assigned to properly prepared students.

230A–230B. Botanical Seminar. (1–1) Yr. M, 7 p.m. The Staff
Graduates and advanced undergraduates meet once a week for the discussion of special topics. The chairman of the department should be consulted.

299. Thesis for the Master's Degree.
Students who are candidates for the Master's degree are required to enroll for work in connection with a thesis, the plan of which should be arranged with the instructor concerned.

Courses in Other Departments

The following courses in Agriculture are suggested as desirable collateral courses to the work of the department.

Agricultural Chemistry 103.
Agronomy 108,
Genetics 1,
Plant Pathology 120.
Soil Chemistry 122A–122B, 235.

Digitized by Google

CELTIC

WILLIAM W. LYMAN, Jr., M.A., Associate in English and Celtic.

PREPARATION FOR THE MAJOR

Required: Celtic 1 (6). Recommended: Latin or Greek; a modern language.

LOWER DIVISION COURSE

1A–1B. Elementary Modern Irish. (3–3) Yr. LYMAN
Essentials of grammar; stories and poems by contemporary writers.

UPPER DIVISION COURSES

101A–101B. Advanced Modern Irish. (2–2) Yr. LYMAN
Prose romances of the eighteenth and nineteenth centuries.

104A–104B. Advanced Modern Welsh. (2–2) Yr. LYMAN
Reading of prose texts.

150A–150B. The Development of Irish Philology and Literature. LYMAN
Special problems.

GRADUATE COURSE

*201. Seminar in Old Irish. (3–3). Either half-year. LYMAN
Intensive study of Old Irish documents with discussions of the relation of the language to comparative philology.

---

* Not to be given, 1920–1921.

Digitized by Google

CHEMISTRY

GILBERT N. LEWIS, Ph.D., Professor of Chemistry and Dean of the College of Chemistry.

EDMOND O'NEILL, Ph.B., Professor of Inorganic Chemistry and Director of the Chemical Laboratory.

WILLIAM C. BRAY, Ph.D., Professor of Chemistry.

JOEL H. HILDEBRAND, Ph.D., Professor of Chemistry.

WALTER C. BLASDALE, Ph.D., Professor of Chemistry.

CHARLES W. PORTER, Ph.D., Associate Professor of Chemistry.

MERLE RANDALL, Ph.D., Assistant Professor of Chemistry.

GEORGE E. GIBSON, Ph.D., Assistant Professor of Chemistry.

GERALD E. K. BRANCH, Ph.D., Assistant Professor of Chemistry.

ERMON D. EASTMAN, Ph.D., Assistant Professor of Chemistry.

THOMAS D. STEWART, Ph.D., Assistant Professor of Chemistry.

WENDELL M. LATIMER, Ph.D., Instructor in Chemistry.

ROY F. NEWTON, Ph.D., Instructor in Chemistry.

HARRY EAST MILLER, Ph.D., Research Associate.

AXEL R. OLSEN, Ph.D., Research Associate.

WORTH H. RODEBUSH, Ph.D., Research Associate.

F. RUSSELL BICHOWSKY, Ph.D., Research Associate.

Laboratory Fees.—The deposit required for courses 1A and 1B is $17.50, of which the maximum amount returnable is $5; for courses 5, 6A, 6B, 120, 120H, 121, 121H, 124, 141, 145, 179, 180H, it is $17, of which the maximum amount returnable is $5; for courses 9, 100, 101, it is $28, of which the maximum amount returnable is $10; for courses 111, 111H, it is $23, of which the maximum amount returnable is $5.

PREPARATION FOR THE MAJOR

Minimum requirement, before the junior year: Chemistry 1A–1B (10), Physics 1A–1B or 2A–2B (6), Mathematics 3A–3B (6) or 5 (5), German. Chemistry units in excess of 14 are counted as upper division credits.

Chemistry 1A–1B is prerequisite to all other courses in chemistry. Students who intend to take work beyond Chemistry 1A–1B should enter upon courses 6A–6B, 8, 9, and 110 before proceeding with any more advanced course. A thorough training in physics and mathematics should not be neglected. The sequence of courses listed for the College of Chemistry in the Circular of Information is recommended.

All undergraduate students from other institutions, who desire to take courses in chemistry more advanced than course 1A–1B, must present themselves to Mr. Blasdale, 221 Chemistry Building, on or before the

Digitized by Google

date of their registration for an informal examination or test of their fitness to undertake such work.

Students in the College of Chemistry are required to submit their proposed schedules to Mr. O'Neill, 114 Gilman Hall. Students in the College of Letters and Science who propose to make chemistry their major are recommended to consult Mr. Hildebrand, 115 Gilman Hall. Whether the student intends to prepare himself for research in governmental, industrial, or educational institutions, for teaching, for analytical chemistry, manufacturing chemistry, the chemistry of petroleum or any of the other branches of chemical engineering, it is desirable that a complete schedule of courses, chosen with a definite purpose and free from conflicts, be arranged at the earliest possible date. A general schedule for students in chemical engineering will be found in the announcement of the College of Chemistry in the Circular of Information.

The chemical laboratories are well equipped for research work, and are open to properly qualified graduate students, not only during the college year but also throughout the summer vacation.

Honors-Students in the Upper Division.—Students in the College of Chemistry, and those in the College of Letters and Science who propose to make chemistry their major, are urged, when eligible, to enroll at the beginning of their junior year as candidates for honors. Honors-students will be given a larger share of personal instruction and a greater opportunity to choose courses, and work within courses, in a manner best suited to individual needs and aims. Students not in the honors-group will not, except under unusual circumstances and with the express permission of the instructor, be permitted to enroll for honors courses (marked H) nor for undergraduate research. Students in the College of Letters and Science enrolled in the honors-group will not ordinarily be recommended for honors in chemistry at graduation unless their work includes courses 6A–6B, 8, 9, 110, 114H, 116H, and 180H. Students enrolled in the honors-group should confer with Mr. Bray, Chairman of the Committee on Honors in Chemistry, regarding their whole plan for the last two years of college work.

Lower Division Courses

1A–1B. General Chemistry. (5–5) Yr. Hildebrand, Bray, Latimer
Lectures in three sections: Sec. 1, Tu Th, 11; Sec. 2, W F, 9; Sec. 3, W F, 10. Laboratory and quiz in five sections: Sec. 1, M F, 8–11; Sec. 2, M F, 1–4; Sec. 3, Tu Th, 9–12; Sec. 4, Tu Th, 1–4; Sec. 5, W, 1–4, S, 9–12. Prerequisite: any two of the following—high school chemistry, physics, trigonometry.

5. Quantitative Analysis. (3). Either half-year. Blasdale
Lecture, S, 9; laboratory, M F, 1–4.

Short course in the principles and methods of quantitative analysis; for students who do not intend to take further work in chemistry.

6A–6B. Quantitative Analysis. (3–3) Yr. Blasdale, Gibson
Lecture, Sec. 1, W, 9, Sec. 2 to be arranged; laboratory, Tu Th or M F, 1–4.

Full course in the principles and methods of quantitative analysis.

Digitized by Google

8. Organic Chemistry. (3). Either half-year. PORTER, STEWART
Tu Th S, 8.

An introductory study of the compounds of carbon. Lectures with experimental illustrations. Laboratory course 9 should, if possible, be taken at the same time.

9. Organic Chemistry—Laboratory. (3). Either half-year.
PORTER, STEWART, BRANCH
Sec. 1, M, 1–5, F, 1–4; Sec. 2, Tu, 1–5, Th, 1–4; Sec. 3, W, 1–5, S, 9–12.

An experimental study of the physical properties and chemical reactions of the common classes of organic substances. Open to students who are taking or have taken Chemistry 8.

UPPER DIVISION COURSES

100. Organic Chemistry—Advanced Laboratory. (3) II. STEWART
M W F, 1–4. Prerequisite: courses 9 and either 5 or 6A.

Quantitative analytical methods of organic chemistry and advanced laboratory technique.

101. Organic Chemistry—Advanced Laboratory. (3) I. BRANCH
Tu W Th, 1–4.

Synthetic methods of organic chemistry. An introduction to research methods. A reading knowledge of German is required in this course.

102A–102B. Advanced Organic Chemistry. (3–3) Yr. STEWART, PORTER
M W F, 9. Prerequisite: courses 8 and 9, and a reading knowledge of German.

Lectures and discussions of selected topics.

110. Physical Chemistry. (3) II. M W F, 10. EASTMAN
Prerequisite: course 5 or 6A; Physics 1A–1B or 2A–2B.

Lectures and problems. Required for all later work in physical chemistry.

111–111H. Physical Chemistry—Laboratory. (4) Either half-year.
EASTMAN, LATIMER
M W F, 1–4, and one other hour. Prerequisite: course 110 and calculus.

Physico-chemical problems and measurements.

114H. Physical Chemistry—Thermodynamics. (3) I. GIBSON
M W F, 10. Prerequisite: courses 6A–6B, 110; Physics 1A–1B, 2A–2B, 3A–3B; mathematics, familiarity with differential and integral calculus.

The principles of thermodynamics, with examples of their application to chemistry.

116H. Physical Chemistry—Advanced. (3) II. M W F, 9. GIBSON
Prerequisite: courses 111H and 114H.

Digitized by Google

120–120H. Advanced Inorganic Chemistry. (3) II. BRAY
Lecture, Tu, 10; laboratory, Tu, 1–4, and one other period. Prerequisite: course 6A–6B (5 only by special permission), and 110 which may be taken simultaneously.

Preparation and experimental study of substances, designed primarily to illustrate the factors which influence equilibrium and the speed of chemical reactions. Correlation of material by means of the periodic system.

121–121H. Advanced Inorganic Chemistry. (3) I. BRAY
Lecture, Tu, 10; laboratory, Tu, 1–4, and one other period. Prerequisite: course 120 or 120H.

Continuation of course 120, including advanced qualitative analysis with some study of the rare elements.

122. Phase Rule. (2) II. Tu Th, 11. BLASDALE
Prerequisite: course 110.

The use of the Phase Rule in the treatment of a variety of chemical problems, especially those of practical interest.

124. Advanced Quantitative Analysis. (2) I. Tu Th, 9–12. BLASDALE
The theory and use of special methods of quantitative analysis.

The prerequisites for courses 140A, 140B and 141 are as follows: courses 6A–6B, 8, 9, 110, and 111.

140A. Technical Chemistry. (2) I. Tu Th, 8. O'NEILL
The processes employed in chemical manufacturing; installation of large scale apparatus, management, and costs.

140B. Chemical Technology. (2) II. Tu Th, 8. O'NEILL
Continuation of course 140A, with special reference to the chemical technology of the Pacific Coast.

141. Chemical Technology—Laboratory. (2) I. RANDALL
M F or Tu Th, 1–4.

Small scale manufacture, plant design, technical analytical control and experimental study of technical processes. The special field of work for each student will be selected.

145. Chemical Technology. (3) I. RANDALL
Lect., M, 8; lab., Tu Th, 1–4. Prerequisite: courses 110 and 111.

Lectures and laboratory exercises dealing with certain fundamental electro-chemical processes, and with the chemical, physical, and economic factors involved in electro-chemical technology. Courses 141 and 145 should be taken simultaneously if possible.

160. History of Chemistry. (2) I. Tu Th, 9. O'NEILL
Prerequisite: courses 5 or 6A–6B, 8, 110.

The development of modern chemistry.

179. Special Laboratory Work. (2–4). Either half-year. The STAFF
Prerequisite: Chemistry 100 and 110.

Students may be given an opportunity to carry on laboratory work not included in listed courses. Such work may be undertaken only under the direction of a member of the instructing staff who is willing to supervise it.

Digitized by Google

180H. Research Work. (2–4). Either half-year. The STAFF
Prerequisite: Chemistry 100 and 110.

Students who have completed with high credit a satisfactory number of advanced courses may prosecute original research representing not less than 4 units of experimental work under the direction of one of the members of the instructing staff. The explicit consent of the instructor must be obtained.

190H. Pro-seminar in Chemistry. See course 290. The STAFF

199H. Special Problems. (2–3). Either half-year. The STAFF
Reading and conference for individual honors-students.

GRADUATE COURSES

280. Graduate Research. (3–5). Either half-year. The STAFF

The laboratory is open at all times to graduate students who wish to prosecute original investigations. Such work will ordinarily be under the direction of some member of the instructing staff who will determine the credit value of the work.

290. Seminar. (1 or 2). Either half-year. The STAFF

As a rule two seminars are offered in each half-year. The subjects will vary from year to year and will be announced at the beginning of each half-year. In certain cases courses 190H and 290 will be combined.

299. Thesis for the Master's Degree. Either half-year. The STAFF

Research Conference.—Members of the instructing staff and students engaged in graduate research meet once a week to discuss the various investigations in progress in the laboratory. M or W, 11. No credit.

COURSES IN OTHER DEPARTMENTS

Metallurgy and Assaying. [See under Mining and Metallurgy.]

Minerals and Blowpipe Analysis. [See under Geology and Mineralogy.]

Sanitary Chemistry and Water Analysis. [See under Civil Engineering.]

Electric Discharges through Gases. [See under Physics.]

COURSES IN THE DEPARTMENT OF AGRICULTURE

Analysis of Agricultural Products. [See under Agricultural Chemistry.]

Food Analysis. [See under Nutrition.]

Digitized by Google

CIVIL ENGINEERING

CHARLES DERLETH, Jr., C.E., Professor of Civil Engineering and Dean of the College of Civil Engineering.

CHARLES G. HYDE, B.S., Professor of Sanitary Engineering.

FRANCIS S. FOOTE, Jr., E.M., Professor of Railroad Engineering.

ARTHUR C. ALVAREZ, B.S., Associate Professor of Civil Engineering.

*ADOLPHUS J. EDDY, B.S., Associate Professor of Civil Engineering.

CLEMENT T. WISKOCIL, C.E., Associate Professor of Civil Engineering.

WILFRED F. LANGELIER, M.S., Assistant Professor of Sanitary Engineering.

CHARLES C. SWAFFORD, M.S., Instructor in Civil Engineering.

CLARENCE J. NOBMANN, B.S., Instructor in Civil Engineering.

BRUCE JAMEYSON, B.S., Instructor in Civil Engineering.

GEORGE E. TROXELL, B.S., Instructor in Civil Engineering.

VALDEMAR ARNTZEN, Expert Mechanic in Civil Engineering Laboratory.

Laboratory Fees.—Five dollars a half-year for courses 1A–1B, 1E, 102; $7.50 for 123 and 128; $10 for 108C, 108E, 108F; and $20 each for 3 and 103.

Honors.—Students will be recommended for honors on the basis of the quality of the work done in the regular curriculum of the senior year. Particular emphasis will be placed upon the thesis.

LOWER DIVISION COURSES

1A–1B. Plane Surveying. (3–3) Yr.
FOOTE, ALVAREZ, NOBMANN, SWAFFORD, JAMEYSON, TROXELL

In 11 sections: Secs. 1, 2, 3, M F, 8; Secs. 4, 5, M F, 9; Secs. 6, 7, 8, 9, 10, 11, Tu Th, 8. In fifteen field periods; periods 1, 2, M, 1–4; periods 3, 4, Tu, 9–12; periods 5, 6, Tu, 1–4; period 7, W, 8–11; periods 8, 9, W, 1–4; periods 10, 11, Th, 9–12; periods 12, 13, Th, 1–4; periods 14, 15, F, 1–4. Prescribed: freshman year, in the colleges of engineering. Prerequisite: plane trigonometry and geometrical drawing. Fee, $5 each half-year.

Methods of plane surveying; field practice; calculations, and mapping.

1E. Plane Surveying. (3) II. FOOTE, SWAFFORD

Tu Th, 11; W or Th, 1–4. Open only to students in Agriculture and Architecture. Fee, $5. Prerequisite: plane trigonometry and geometrical drawing.

The more elementary parts of course 1A–1B briefly presented.

*Absent on leave 1920-21.

Digitized by Google

3. Summer Class in Plane Surveying. (3) II.
FOOTE, ALVAREZ, NOBMANN, SWAFFORD, JAMEYSON, TROXELL
Fee, $20. Prerequisite: course 1A–1B.

The course begins the day after Commencement and lasts four weeks. The summer school site is near Santa Cruz.

8. Materials of Engineering Construction. (2) II. ALVAREZ, WISKOCIL
Sec. 1, M F, 9; Sec. 2, Tu Th, 8. Prerequisite: sophomore standing.

The structural properties and adaptability of various materials employed in engineering construction.

25. Plumbing, Heating, Ventilating and Lighting. (2) I. LANGELIER
Tu Th, 9. Prerequisite: Physics 1A–1B, Chemistry 1A–1B, Hygiene 1, or equivalents.

For students of public health and sanitary engineering.

UPPER DIVISION COURSES

102. Railroad Surveying. (3) I. FOOTE, NOBMANN
W F, 8; Tu, 1–4. Prerequisite: course 3. Fee, $5.

Simple, compound, and transition curves; reconnaissance, preliminary and location surveys; calculations of earthwork and other quantities; field work, such as running in curves, etc.

102C. Railroad Engineering Office Practice. (1) II. Tu, 1–4. FOOTE
Prerequisite: course 102.

The plotting of railroad maps and profiles; calculation of volumes of masonry and earthwork; drafting of railroad structures.

103. Summer Class in Railroad Surveying. (3) II.
FOOTE, ALVAREZ, NOBMANN, SWAFFORD, JAMEYSON, TROXELL
Fee, $20. Prerequisite: courses 3 and 102.

The course begins the day after Commencement and lasts four weeks. The summer school site is near Santa Cruz.

104A. Economics of Railroad Location. (3) I. M W F, 10. FOOTE
Prerequisite: course 102.

Influence of railroad location upon profit-producing value, with particular reference to the effect of distance, curvature, and grades upon operating expenses.

104B. Railroad Construction and Maintenance. (3) II. FOOTE
M W F, 10. Prerequisite: course 102.

Grading, tunneling, waterways, track laying; the materials and methods used in maintenance work; signaling and interlocking; yards and terminals.

105. Higher Surveying and Geodesy. (2) II. M W, 9. FOOTE
Prerequisite: course 3; Astronomy 3 and 107.

Methods of geodetic surveying; adjustment of observations; geodetic positions; map projections.

Digitized by Google

106. Highway Engineering. (2) I. Tu Th, 11. HYDE
Prerequisite: course 8.

The location, design, construction, and maintenance of roads and streets; the construction and maintenance of pavements.

107A. Framed Structures. (3) II. M F, 8; Th, 1–4. ———

Open to students in Civil Engineering who have taken or who are taking courses 108A–108B and Mechanics 102A–102B.

The computation of stresses in roofs, building frames, and simple bridge trusses, by analytical and graphical methods.

107C–107D. Framed Structures. (3–3) Yr. Tu Th, 10; W, 1–4. DERLETH
Prerequisite: courses 107A and 108A–108B.

Continuation of course 107A. Stress computations for steel-framed structures; the design of plate girders, roof, and bridge trusses; bridge shop practice.

107E–107F. Framed Structures. For architectural students. (3–3) Yr.

Tu Th, 8; M, 1–4. Prerequisite: courses 117 and 118A–118B.

Stress computations and design of structures in wood, steel and reinforced concrete, particularly of buildings; foundations and retaining walls; structural specifications.

108A–108B. Strength of Materials. (3–2) Yr. ALVAREZ, ——, WISKOCIL
Secs. 1 and 2, M W F, 9; Secs. 3 and 4, M W F, 10. Prerequisite: Mathematics 4A–4B. Mechanics 102A–102B must be taken concurrently.

The elastic and ultimate resistance of materials; stress analysis for bars, beams, columns and shafts; theory of resilience; deflections and combined stresses; elements of design for wood, steel, and reinforced concrete structures.

108C. Civil Engineering Laboratory . (2) I. WISKOCIL
Sec. 1, M, 1–4; Sec. 2, W, 1–4.
Prerequisite: courses 8 and 108A–108B. Fee, $10.

Physical tests of bricks, concrete, iron, steel and wood.

108E. Civil Engineering Laboratory. (1) II. WISKOCIL
Sec. 1, M, 1–4; Sec. 2, F, 1–4. Prerequisite: course 8 and satisfactory standing in 108A–108B. Fee, $10.

Physical tests of cement, concrete, mortar and aggregates for concrete.

108F. Civil Engineering Laboratory. (1) II. M, 1–4. WISKOCIL
Prerequisites: courses 8 and 118A–118B. Fee, $10. For students of architecture only.

Physical tests of bricks, cement, concrete, iron, mortar.

109A. Sewerage Engineering. (2) I. M W, 8. HYDE
Prerequisite: course 110.

The design and construction of sewerage works.

Digitized by Google

109B. Sewage and Sewage Disposal. (1) I. Tu, 9. HYDE
Prerequisite: Chemistry 5 and 8, Bacteriology 1.

The chemical and biological character of sewage; its treatment and disposal.

110. Hydraulics. (3) I. Tu Th, 10; Th, 1–4. HYDE
Prerequisite: Mathematics 4A–4B. Mechanics 102A–102B must be taken concurrently.

Theory of hydraulics; application of principles; water-measuring devices; stream gauging.

111A. Water Supply Engineering. (2) II. Tu Th, 11. HYDE
Prerequisite: course 110.

The design and construction of water works.

111B. Character and Sanitation of the Water Supply. (1) II. HYDE
W, 10. Prerequisite: Chemistry 5 and 8; Bacteriology 1; Zoology 109.

Water from the aesthetic, commercial, and sanitary points of view; water purification.

113. Foundations of Structures. (2) I. Tu Th, 8. DERLETH
Prerequisite: course 108A–108B.

Ordinary foundations, footings, sheet piling, piles, coffer-dams, open caissons, the pneumatic process; deep well dredging.

114. Masonry Structures. (3) II. Tu Th, 9; W, 1–4. DERLETH
Prerequisite: courses 108A–108B and 113.

Design of typical masonry structures, such as dams, retaining walls, bridge piers, abutments, culverts, aqueducts, chimneys, stone and concrete arches, and arch bridges.

*115. Fireproofing. (2) I. M W, 11. ALVAREZ

The resistance of building materials to fire; fire resistive and slow-burning construction; fire extinguishing equipment; corrosion and preservation of structural metal. Elective for students of civil engineering and architecture. Course 108A to be taken concurrently.

116. Engineering Contracts and Specifications. (2) II. Tu Th, 1. HYDE
Prerequisite: junior standing.

Contracts, specifications, engineering relations, principles of engineering economics.

117. Framed Structures. (3) II. M W, 9; M, 1–4. NOBMANN
Prescribed for architectural students who are taking course 118A-118B.

The computation of stresses in roofs, building frames and other structures by analytical and graphical methods.

---

* Not to be given, 1920–21.

Digitized by Google

118A–118B. Strength of Materials. (3–3) Yr. M W F, 10. ———
Prescribed for students of architecture. Prerequisite: Mathematics 4A–4B, Physics 1A–1B, Civil Engineering 8.

Elementary analytic mechanics, particularly the theory of statics; the elastic and ultimate resistance of materials; stress analysis for bars, beams and columns; theory of resilience, deflections and combined stresses. Application of statics and the theory of the elasticity and strength of structural materials to the elements of design for buildings.

119A–119B. Thesis for B.S. Degree. (2–2) Yr. ———
For the regulations governing thesis work see the annual Circular of Information, Academic Departments. Candidates for B.S. who elect a thesis in the department of Civil Engineering will register, during both half-years, of the last or senior year, for Civil Engineering 119. Candidates who elect their theses in other departments will register according to announcements of those departments.

Students who contemplate theses in the civil engineering laboratories should notify the department before December of the junior year.

123. Sanitary Engineering Laboratory. (3) I. LANGELIER
Tu W Th, 2–5. Prerequisite: Chemistry 5, or equivalent. Fee, $7.50. Required of sanitary engineering students, but arrangements will be made for instruction of students in other departments.

The chemical and biological examination of water and sewage, with particular reference to the analytical control of water purification and sewage treatment plants.

124. Principles of Water Supply, Sewerage, and Municipal Wastes Engineering. (3) II. M W F, 8. LANGELIER
Prerequisite: junior standing. Designed primarily for students of public health.

Water supply and sewage works; purification of water; treatment of sewage and the disposal of refuse.

125. Plumbing, Heating, Ventilating and Lighting. (2) I. LANGELIER
M W, 11. Prerequisite: junior standing.

For students of home economics.

126. Applied Sanitary Science and Municipal and State Sanitation. (2) II. Tu Th, 9. HYDE
Prerequisite: Zoology 109, Bacteriology 1, Chemistry 5 and 8, and Civil Engineering 109B.

The application of the principles of sanitary science to the work of municipal and state sanitation.

NOTE.—Special arrangements will be made for students in other courses and in other departments who may desire to take this course.

128. Sanitary Engineering Laboratory. (3) II. LANGELIER
Tu W Th, 2–5. Prerequisite: Chemistry 1A–1B. Fee, $7.50.

For students of public health; may be elected by students in other departments.

The chemical and biological examination of water and sewage. Laboratory exercises and lectures on the interpretation of analyses.

Digitized by Google

GRADUATE COURSES

*220A–220B. Framed Structures. Yr. DERLETH
Prerequisite: course 107C–107D.

The design of continuous girders, swing, cantilever, suspension and metallic arch bridges, and of reinforced concrete structures. Programme of work to be arranged each year.

*221A–221B. Theory of Resilience and Deflections. Yr. DERLETH
Prerequisite: course 107C–107D.

Applications to the statically indeterminate structures. Programme of work to be arranged in each case.

222A–222B. Sanitary Design. Yr. HYDE
Individual assignments. Prerequisite: courses 109A, 109B, 110, 111A and 111B.

The design of elements of systems for water supply, water purification, sewerage, sewage and refuse treatment and disposal, etc.

223. Laboratory Experiments. DERLETH, WISKOCIL
Programme of work to be arranged in each case. Prerequisite: courses 8, 108A–108B, 108C, and 108E.

For advanced work in civil engineering the testing laboratory is equipped with apparatus specially designed to make tests and original studies upon the strength and elasticity of structural materials.

*224. Harbor Engineering. (1–2) I. ALVAREZ
Harbor planning; design and construction of breakwaters and docks; river improvements.

225. Advanced Sanitary Engineering Laboratory. HYDE and LANGELIER
Programme of work to be arranged in each case. Prerequisite: course 123. Fee, $2.50 per unit.

Special laboratory problems in water, sewage, air, and refuse analysis; tests of apparatus, experimental or practical, in available localities.

* Not to be given, 1920–21.

Digitized by Google

DRAWING AND ART

*Hermann Kower, C.E., Professor of Drawing.

Perham W. Nahl, Assistant Professor of Freehand Drawing and Art Anatomy.

Willson J. Wythe, B.S., Assistant Professor of Mechanical Drawing.

C. Chapel Judson, Assistant Professor of Graphic Art.

Eugen Neuhaus, Assistant Professor of Art Appreciation.

Ross J. Brower, B.S., Associate in Drawing.

Daryl B. Miller, A.B., Associate in Drawing.

Oliver M. Washburn, A.B., Associate Professor of Classical Archaeology.

Mary F. Patterson, Associate Professor of Design and Household Art.

M. Earl Cummings, Assistant Professor of Modeling.

ENGINEERING DRAWING

Preparation for the Major

Required: Drawing C (2 units), 3A, 3B (6), 9 (1); Graphic Art AB (2); Architecture 11 (3); Mechanics 6A (3); Civil Engineering 1E (3). Recommended: Mathematics A, C (6); and 3 AB (6).

Honors-Students in the Upper Division.—Prospective candidates for honors must have the permission of the department before undertaking upper division work, and permission will be granted only to those who have shown proficiency in the lower division work and who have passed such examinations in the elementary subjects as may be required by the department. Credit for advanced work done in other institutions will be given only upon a satisfactory test in correlated lower division subjects.

The requirement for the major is 24 units of drawing, which must normally include courses 105, 110, Architecture 101A–101B, 106A–106B, and Mechanics 106B. Candidates will be recommended for honors on the basis of the quality of the work done in the regular curriculum.

Lower Division Courses

Course C or the high school course in geometrical drawing is prerequisite to courses 3A, 3D, and 9.

C. Instrumental Drawing. (2) Either half-year. Miller
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 9–12; Sec. 3, Tu Th, 1–4; Sec. 4, W, 1–4, S, 9–12.

Use of instruments; solving of geometrical problems; construction of mathematical curves; lettering; technical drawings.

---

* Absent on leave, 1920–21.

Digitized by Google

3A. Descriptive Geometry. (2) I. M F, 1–4. WYTHE

Courses 3A, 3B and 3C are intended for students in architecture, candidates for teachers' recommendations, and honor-students. Problems dealing with points, lines and planes.

3B. Descriptive Geometry. (2) II. M F, 1–4. WYTHE

Prerequisite: course 3A.

Problems dealing with solids, warped and irregular surfaces.

3C. Descriptive Geometry. (2) I. Tu Th, 1–4. WYTHE

Prerequisite: course 3B, or course 3D.

Problems dealing with shades, shadows and perspective.

3D. Descriptive Geometry. (3) Either half-year. BROWER

Drafting and lectures. Sec. 1, M F, 1–4; Sec. 2, Tu Th, 9–12; Sec. 3, Tu Th, 1–4. One lecture hour per week to be arranged.

For students in engineering.

8. Freehand Line Lettering. (1) Either half-year. MILLER

Sec. 1, M, 1–4; Sec. 2, Tu, 9–12; Sec. 3, Tu, 1–4; Sec. 4, W, 1–4.

Single stroke letters; construction of titles.

9. Lettering. (1) Either half-year. WYTHE, MILLER

Sec. 1, Tu, 1–4; Sec. 2, F, 1–4.

Freehand and instrumental; alphabets; construction of titles.

10. Advanced Lettering. (1) II.

UPPER DIVISION COURSES

105. Graphostatics. (2) II. Sec. 1, W, 2–4; Sec. 2, F, 2–4. WYTHE

Prerequisite: Civil Engineering 108A and Physics 105A or Mechanics 102A.

Graphic analysis of stresses in engineering structures.

110. Stereotomy. (2) I. M F, 1–4. WYTHE

Continuation of course 3, intended for students of architecture.

300A–300B. Teachers' Training Course. (1–1) Yr. Th, 4. WYTHE

Teacher training course in mechanical drawing. Various courses in secondary schools; methods of teaching; examination of textbooks; visiting schools; drawing with criticism.

GRADUATE COURSE

224A–224B. Seminar in Mechanical Drawing. WYTHE, BROWER

Advanced work in mechanical drawing for graduate students.

Digitized by Google

GRAPHIC ART

Preparation for the Major

Required: Graphic Art AB (2), 1A–1B (6), 6A–6B (6), 14 (2); Engineering Drawing C (2), 9 (1).

Honors-Students in the Upper Division.—Prospective candidates for honors must have the permission of the department before undertaking upper division work, and permission will be granted only to those who have shown proficiency in the lower division work and who have passed such examinations in the elementary subjects as may be required by the department. Credit for advanced work done in other institutions will be given only upon a satisfactory test in correlated lower division subjects. Courses AB, 1A–1B, 6A–6B, 14 and Engineering Drawing C and 9 are normally prerequisite to honors-work in the upper division. The requirement of 24 units in upper division courses must normally include courses 114A–114B, 115A–115B, 116A–116B or 127, 128A–128B. Candidates of marked ability who have taken 24 units of varied upper division work with excellent results will be recommended for honors. A command of scientific and artistic perspective, creative ability in design as well as in color, and a thorough knowledge of art anatomy will be regarded as essential.

Lower Division Courses

AB. Elementary Freehand Drawing. (2) Either half-year. ——
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4; Sec. 3, W, 1–4, S, 9–12.

Fundamental principles of freehand drawing, embracing the study of light and shade and perspective; drawing from memory; lectures. Equivalent to the high school course in freehand drawing.

1A–1B (or 1C). History of Art. (3–3) Yr. Washburn, Neuhaus
M W F, 4.

Lectures on the development of art in the western world from the palaeolithic age to the present century.

1A. The art of Egypt, Mesopotamia, Greece, and Rome and of the early Christian and Byzantine periods.

1B. The art of the Renaissance and modern periods in Europe, alternating with

1C. Which deals with the development of the fine arts, particularly painting, in our own country.

Sections will be provided for class study.

6A–6B. Theory of Design and Color. (3–3) Yr. Patterson
Lectures and laboratory, M W, 1–4. Prerequisite: Graphic Art AB and Drawing C.

The study of the underlying principles of design based on the laws of force or growth in nature and expressed through the medium of tones, measures and shapes in orderly repetitions of balance, sequence and harmony; analysis of historic examples; original problems illustrating the theory as applied in the general field of design; outside work required.

Digitized by Google

12. Elementary Design Practice. (2) Either half-year. ——
Tu Th, 1–4. Prerequisite: Graphic Art 6A–6B. Laboratory fee, $1.50.

The application of the principles of the theory of design and color to elementary problems of original design, study of order in nature and historic art; analysis of the principles underlying both and of the technical processes by which they may be expressed. Field work: visits to zoological, anthropological and fine arts collections.

14. Advanced Freehand Drawing. (2) Either half-year. JUDSON
Sec. 1, Tu Th, 9–12; Sec. 2, Tu Th, 1–4; Sec. 3, Tu Th, 9–12; Sec. 4, Tu Th, 1–4.

A study of proportion, light and shade.

19. Appreciation of Art. (2) Either half-year. M F, 1. NEUHAUS
Lectures on the principles which underlie the theory and practice of the fine arts.

UPPER DIVISION COURSES

101A–101B. Modeling of the Human Figure. (1–1) Yr. CUMMINGS
F, 8–11. Prerequisite: Architecture 14A–14B.

114A–114B. Advanced Work in Freehand Drawing. (2–2) Yr.
Sec. 1, Tu Th, 9–12; Sec. 2, Tu Th, 1–4. JUDSON, ——

A study of the antique.

115A–115B. Drawing from Costumed Model; Composition. (2–2) Yr.
W S, 9–12. JUDSON

116A–116B. Still-Life Painting. (2–2) Yr. M F, 9–12. JUDSON

127. Art Anatomy. (2) I. M F, 4. NAHL

Academic laws of proportion and cross-sections.

128A–128B. Life Class. (2–2) Yr. NAHL
Sec. 1, Tu Th, 9–12; Sec. 2, M F, 9–12. Fee, $5 each half-year.

167A–167B. Form and Color. (3–3) Yr. M F, 9–12. NEUHAUS
Beginning either in August or in January. Prerequisite: courses AB, 14.

Practical problems in pictorial analysis; occasional lectures, class problems and papers.

168. Community Art. (3) I. M W F, 4. NEUHAUS
Prerequisite: senior standing.

Discussion of the aesthetic problems of community life. The promotion of artistic appreciation through the fine and applied arts.

194A–194B. Advanced design. (2–2) Yr. W F, 1–4. ——

Laboratory fee, $1.50, covers use of equipment, dyes, wax, etc. Materials for individual projects to be furnished by students. Prerequisite: Graphic Art 12. Recommended: Household Art 193A–193B to be taken concurrently, also Graphic Art 127 and 128A–128B.

The application of the principles of design and color to advanced problems, with renderings in several mediums. Experimentation in materials with dyes and dye resists.

Digitized by Google

198A–198B. Pro-seminar in Japanese Art. (1–1) Yr. S, 9–12. NAHL

199. Pro-seminar in Graphic Art. (1 or 2) Either half-year. JUDSON, NAHL

According to the interests and requirements of the students.

GRADUATE COURSES

215A–215B. Advanced Composition. (2–2) Yr. W S, 9–12. JUDSON

216A–216B. Advanced Painting. (2–2) Yr. M F, 9–12. JUDSON

228A–228B. Continuation of Course 128A–128B. (2–2) Yr. NAHL
Sec. 1, Tu Th, 9–12; Sec. 2, M F, 9–12. Fee, $5 each half-year.

269. Seminar in Graphic Art. (1 or 2) Either half-year. JUDSON, NAHL

299. Thesis Course. (2–2) Either half-year. JUDSON, NAHL

300. Teachers' Training Course. (2) I. M F, 3. NAHL

Digitized by Google

ECONOMICS

CARL C. PLEHN, Ph.D., LL.D., Professor of Finance on the Flood Foundation.

HENRY R. HATFIELD, Ph.D., Professor of Accounting on the Flood Foundation; Dean of the College of Commerce.

STUART DAGGETT, Ph.D., Professor of Railway Economics on the Flood Foundation.

JESSICA B. PEIXOTTO, Ph.D., Professor of Social Economics.

IRA B. CROSS, Ph.D., Professor of Economics on the Flood Foundation.

LUCY W. STEBBINS, A.B., Associate Professor of Social Economics.

SOLOMON BLUM, Ph.D., Associate Professor of Economics.

—— ——, Associate Professor of Commerce.

WILLIAM LESLIE, B.S., Assistant Professor of Insurance.

WILLIAM KIRK, Ph.D., Assistant Professor of Social Economics.

ELBERT A. KINCAID, M.A., Instructor in Economics.

FELIX FLÜGEL, M.A., Instructor in Economics.

JOHN B. WASHBURN, A.B., Associate in Accounting.

CAROLINE SCHLEEF, A.B., Associate in Social Economics.

RUTH MOODY, Assistant in Economics.

JOHN F. FORBES, C.P.A., Lecturer in Accounting.

CHARLES C. STAEHLING, M.S., C.P.A., Lecturer in Accounting.

ROBERT HUNTER, A.B., Lecturer in Economics.

BARBARA N. GRIMES, A.B., J.D., Lecturer in Law and Social Economics.

—— ——, Lecturer in Banking.

WARNER BROWN, Ph.D., Associate Professor of Psychology.

FRANCES M. GREENE, M.D., Supervisor of Practice Work.

Facilities for Graduate Study.—The University Library is well equipped with works on economics subjects, and in particular with official statistical publications of the chief commercial countries of the world. These materials, with the official trade documents of the San Francisco Customs House, afford opportunity for the study of the trade, resources, and economic geography of particular countries and ports. The unique collection of local materials in the Bancroft Library is available for research in the economic history of the Pacific Coast. A collection of state reports and documents on public finance, complete for the last fifteen years, and in some instances extending over a longer period, may be consulted in the private library of Professor Plehn.

Special facilities also exist at Berkeley for the study of economic problems at first hand. San Francisco is the banking center of the Coast. It is also the terminus of three great railways and a center of Pacific Ocean trade. The distance of California from the Middle West has given

Digitized by Google

great importance to questions of transportation, and rate questions are subjects of constant interest. Mention may also be made of the completeness of labor organization in some parts of California and of its absence in others, of problems of seasonal labor, of the presence of oil fields, irrigation plants, lumbering on a large scale, experiments in co-operation, and the like.

To those interested in social work the high level of income in San Francisco and the importance of preventive or constructive charity also affords matter for investigation.

The course prerequisite to advanced work in the Department of Economics is Economics 1A–1B. A reading knowledge of French and German is eminently desirable, and will ordinarily be required of students in the College of Commerce and of honors-students in economics.

Honors-Students in the Upper Division.—Students in the College of Letters and Science may receive honors in economics at graduation either:

1. Upon the intelligent completion of a course of reading in some general field; or

2. Upon the basis of a thesis showing ability to do original work.

In either case, candidates for honors must prepare a programme at the beginning of their candidacy in consultation with a committee of the department appointed to supervise their work. On approval of this plan of study, the student will proceed to its completion in close co-operation with his committee, attending conferences and making such reports of progress as may be asked for. Students are advised against too narrow specialization. In most cases, the junior year will be spent in preliminary reading. In the senior year, those students who desire to take honors on the basis of reading alone will make that reading more intensive, and will prepare for a final oral examination in which their attainment will be tested; while those who desire to engage in research will prepare a thesis embodying their results. The honors thesis should not show mere industry or mere ability to solve a technical problem, but should also show ability to handle source material and to draw conclusions therefrom.

Honors-students will be allowed much freedom in their studies. To justify this, the work which they do must be consistently of high quality. The department will recommend the exclusion from the honors-group of all students who do not maintain each half-year an average of at least 60 per cent of first and second grades in all their courses and who do not complete their courses in economics with high credit.

All senior students will enroll in course 199A–199B. Juniors, subject to the approval of the department committee on honors, will either enroll in course 198A–198B or be assigned to various courses in economics as their individual needs may require.

Candidates must fulfill the requirements for a major in economics and must include therein at least one course each in advanced theory, economic history and statistics, together with one of the following courses: History 4A–4B, History 8A–8B, Political Science 1A–1B. Honors-students in the College of Commerce may omit the course in advanced theory.

Master's Degree.—Candidates for the master's degree with a major in economics must include in their programme of study a course in advanced economic theory and a course in economic history. The proposed programme must be submitted to the department for approval.

Doctor of Philosophy.—Candidates for the degree of Doctor of Philosophy are expected to make themselves generally familiar with the fields

Digitized by Google

of economic theory, the history of economic theory, and economic history, and with a certain number of subjects in applied economics to be selected in consultation with the department. They are advised to include in their programme a course in statistical methods. Candidates will select some field for special study and will write the usual thesis.

Candidates for the degree of Doctor of Philosophy in other departments who desire to take a minor in economics are required to pursue a course of study to be approved by the department, which should embrace, besides fundamental courses in economic theory, such further work in economics as may properly relate itself to the candidate's major subject.

Course Groups.—The courses offered by the department are divided into four groups. Group A consists of all the lower division subjects, open to students regardless of their colleges or their standing in the university. Group B is made up of the introductory courses in the more specialized fields which are open to students who have completed Economics 1A–1B. Courses in Group C may be taken only by specially qualified students (instructor's consent required) and by graduate students who have had the necessary preliminary training. Group D, comprising the more professional courses, is open only to students registered in the College of Commerce.

GROUP A

Lower Division Courses

1A–1B. Principles of Economics. (4–4) Yr. Cross and the Staff
Lectures, Tu Th, 9, and recitation sections, two hours. Fee, $1 per half-year. Prerequisite: at least sophomore standing. Required for upper division work in the department.

3A. Introduction to Economic Geography. (3) II. Kincaid
M W F, 10. Prerequisite: Geography 1A. Book fee, $1.

10. Economic and Commercial History. (3) Either half-year. Flügel
M W F, 9.

A general survey of some of the more important events in the economic history of Europe.

11. Industrial History of the United States. (3) Either half-year.
M W F, 2. Flügel

A discussion of economic conditions in the United States from 1789 to date.

14A–14B. Principles of Accounting. (3–3) Yr. Hatfield, Washburn
Lectures, Tu Th, 8, and laboratory sections. Prerequisite: at least sophomore standing. Students enrolling in this course may take an extra laboratory period each half-year with one additional unit credit.

26. Agricultural Economics. (3) I. Tu Th S, 11. Kincaid
The economic principles involved in the determination of land values, interest on the farmer's capital, wages of farm labor, and profits in agriculture; economic aspects of tenantry; price making forces in the agricultural industry; the farmer in his business relations. Enrollment limited to students in the College of Agriculture and such others as have the permission of the instructor.

Note.—Credit as Economics will be given if desired for Social Institutions 1, Teggart.

Digitized by Google

GROUP B

Upper Division Courses

Open to all who have had Economics 1A–1B.

*100. Economic Theory. (3) I. M W F, 9.
An intermediate course in theory.

*105. Advanced Economics.
An introduction to modern mathematical and statistical economic theory.

*112. The Trust Problem. (3) II. M W F, 9. Flügel
The rise and development of the modern industrial system with special reference to the trust problem.

*120. Business Organization and Administration. (3) I. Tu Th S, 9.
A survey of the problems that arise in production, sale and distribution of the product.

130–131. American Financial Policy and Public Finance. (2–2) Yr. Tu Th, 11. Plehn
History of currency, banking, taxation and government finance, with special reference to the principles and practice of taxation.

135. Elements of Money, Banking, and Foreign Exchange. (3) I. Cross Tu Th S, 10.

140. Elementary Statistics. (4) I. Leslie
Tu Th, 2, and laboratory periods.
An introduction to statistical method. A knowledge of higher mathematical analysis is not required.

143. Economics of Insurance. (3) I. M W F, 8. Leslie
An elementary course in the principles of insurance. Mathematical treatment will be avoided, so far as possible.

150. Labor Economics. (3) I. M W F, 8. Blum
Book fee, $1.
The history and problems of the labor movement, and the development of labor legislation.

173. Railway Economics. (3) I. M W F, 2. Daggett
A general discussion of railway history, rates, finances, and regulation.

180. The Control of Poverty. (3) I. M W F, 2. Peixotto
Studies in the facts and causes of poverty and of public and private action to prevent destitution.
See also: Child Hygiene, Hygiene 101; General Biology, Zoology 10; Eugenics, Zoology 115; Abnormal Psychology, Philosophy 142A-142B, 143A–143B.

---

* Not to be given, 1920–1921.

Digitized by Google

181. Care of Dependents. (3) II. M W F, 2. STEBBINS
The problems of outdoor and institutional care of the dependent and defective classes. Lectures, reports, and field work.

185. Introduction to Field Work. (1) I. SCHLEEF
Laboratory training for field studies. Open only to students registered in Economics 180.

NOTE.—Credit as Economics will be given for Social Institutions 101A-101B.

GROUP C

UPPER DIVISION AND GRADUATE COURSES

Open only to graduates and specially qualified undergraduates.

UPPER DIVISION COURSES

101. History of Economic Thought. (2) II. Tu Th, 10. PLEHN
A review of economic thought to 1900.

102. Types of Economic Theory. (2) II. Tu Th, 9. BLUM
A critical examination of some of the leading types of economic theory. In 1920–21 the writings of Veblen and Hobson will be considered.

106. Contemporary Theories of Social Reform. (3) II. PEIXOTTO
M W F, 3.
A critical and intensive examination of the nature and history of the leading reform movements of the day.
See also: Philosophies of Social Relations, Philosophy 45A–45B.

107. Critical Study of European Revolutionary Tendencies. (2) II.
Th, 7:30–9:30 p.m. Prerequisite: course 106. HUNTER

142. Advanced Statistics. (3) II. Tu Th, 9, and laboratory. LESLIE
Prerequisite: course 140.
Probability, the theory of error, and the foundations of statistical theory; non-linear regression; multiple correlation.

149A. Record Keeping and Field Studies. (3) I. PEIXOTTO, SCHLEEF
W, 1, and laboratory.
Making record forms; map making; tabulating; framing tables; collecting and interpreting data.

149B. Advanced Record Keeping and Field Studies. (3) II.
W, 1. PEIXOTTO, SCHLEEF

146. Social Insurance. (3) II. Tu Th S, 8. GRIMES
Health, unemployment, workmen's compensation, industrial and old age insurance.

151. Labor Organizations. (2) II. F, 4–6. BLUM
The history, structure, and activities of labor organizations.

Digitized by Google

152. Advanced Labor Economics. (2) I. F, 4–6. BLUM
Prerequisite: course 150 or 151.

153. Employment Management. (2) II. Tu Th, 3.
An analysis of profit-sharing, welfare work, employment management methods, etc.

*182. Studies in the Standard of Living. (3) I. M W F, 3. PEIXOTTO
The theory and practice of spending in the several social classes. Field studies.

*183. Crime as a Social Problem. (3) II. M W F, 3. PEIXOTTO

184. Principles of Case Work. (2) I. Tu, 4-6. STEBBINS
Theory and practice of family case work.

188. Housing. (3) II. M W F, 3. SCHLEEF
Problems of housing and their relation to public welfare. Detailed study of housing laws and their enforcement with special reference to California. Open only to seniors and graduates.

HONORS COURSES

198A–198B. Honors Course for Juniors. Yr. The STAFF

199A–199B. Honors Course for Seniors. Yr. The STAFF

GRADUATE COURSES

Conference in Economics. DAGGETT
The graduate students and faculty of the department will meet from time to time at the call of the chairman to discuss the finished results of research prepared by candidates for higher degrees. No credit in units is given for this course, and students will not register for it.

200A–200B. Economic Theory and Finance. (2–2) Yr. W, 3–5. PLEHN

202A–202B. Advanced Studies in Social Economics. (3–3) Yr. PEIXOTTO
W, 7:30–9:30 p.m., and additional hours to be arranged.
Research in problems of social economics.

203A–203B. Advanced Studies in Social Economics. (3–3) Yr. PEIXOTTO, BLUM, KIRK
Field work in connection with courses 202A–202B, 205A–205B.

205A–205B. Seminar in Labor Economics. (2–2) Yr. BLUM
Th, 7:30–9:30 p.m. Prerequisite: course 150 or 151.

206A–206B. Seminar in Transportation. (2–2) Yr. DAGGETT

* Not to be given, 1920–21.

Digitized by Google

208A–208B. Family Case Work. (3–3) Yr. KIRK, GREENE

Practice work for graduates. Students give three or more half-days weekly as volunteer members of staff in the offices of state commissions, private charities, juvenile courts, or kindred agencies.

299. Thesis for the Master's Degree. The STAFF

NOTE.—Credit as Economics will be given for Social Institutions 201, Teggart.

GROUP D

The following courses are open only to students registered in the College of Commerce.

Business Organization and Management

*121. Factors of Industrial Efficiency. (3) I. Tu Th S, 11.

Modern competitive production; scientific management, etc.

*122. Office Organization, Administration and Procedure. (2) II. Tu Th, 2. ——

A detailed study of the problems which arise in the organization, administration, and procedure of the business office.

123. Markets and Marketing. (3) II. Tu Th S, 11. KINCAID

An analysis of the distributive system for food products. The relations of producers, middle men and consumers. Costs of distribution and prices. Exchanges, speculation, futures; cold storage, transportation, municipal markets. This course affords a foundation for courses in rural institutions.

124. Merchandising Methods. (2) I. M W F, 10. KINCAID

Book fee, fifty cents.

The methods of marketing and merchandising selected products of a representative character such as wool, woolen goods, cotton goods, clothing, shoes, etc. Relations of manufacturers, jobbers and retailers; chain stores, department stores and mail-order houses.

125. Advertising. (2) II. Tu, 7:30 p.m. BROWN

The principles governing the choice of media and the methods of appeal, the amount and nature of the matter, with emphasis upon experimental methods of measuring the effectiveness of advertising. The relation of advertising to marketing. Lectures, investigations and criticism of advertisements.

*141. Statistics in the Service of Business. (3) I. ——

M W, 11, and laboratory. Prerequisite: course 140.

Accounting

Course 14A–14B is prerequisite to the following: courses 160, 162, 164A-164B, 167, 168, 169.

* Not to be given, 1920–21.

Digitized by Google

160A. Analysis of Corporation Accounts and Reports. (3) I. HATFIELD
M W F, 8.

160B. Accounting Systems. (2) II. Tu Th, 8. WASHBURN
Prerequisite: course 14A–14B.

161. Cost Accounting. (2) II. W, 7:30–9:30 p.m. FORBES
Open to advanced students on consent of instructor.

162. Auditing. (2) I. W, 7:30–9:30 p.m. FORBES

163A–163B. Advanced Accounting Problems. (2) Yr. HATFIELD
M W, 11.
Open to advanced students on consent of instructor.

*164A–164B. Public Utility Accounts. (1–1) Yr. Th, 8. FORBES

165A–165B. Governmental Accounts. (1–1) Yr. Th, 8. FORBES

167. Partnership Accounting. (2) I. Tu Th, 8. WASHBURN

*168. Fiduciary Accounting. (2) II. Tu, 7:30 p. m.

169. Income Tax Procedure. (2–2) Yr. Tu, 7:30 p.m. STAEHLING

Finance

Course 135 is prerequisite to courses 136 and 137A–137B.

*133. Corporation Finance and Investments. (3) II. HATFIELD
M W F, 8.

*134. Investments. (2) II. Tu Th, 3. HATFIELD

136. Foreign Exchange. (3) II. Tu Th S, 10. CROSS

137A–137B. Advanced Money and Banking. (2–2) Yr. Tu, 4–6. CROSS

138. The Federal Reserve System. (2) II. Th, 7:30–9:30 p.m. TUCKER

Insurance

Course 143 is prerequisite to courses 144 and 145.

NOTE.—Students who wish to prepare themselves for actuarial work should confer with the instructor concerning the best choice of their mathematical courses.

144. Life Insurance. (3) I. Tu Th S, 8. LESLIE
History of life insurance; forms of company organization and management; surplus; taxation. Mathematical treatment will be avoided.

145. Property Insurance. (3) II. M W F, 8. LESLIE
Fire, marine, burglary, automobile, plate glass, boiler, flywheel, etc.

* Not to be given, 1920–21.

Digitized by Google

147. Special Problems in Social Insurance. (3) II. Tu Th S, 8. ——
Limited to a small number of students whose records indicate ability to do advanced work. The consent of the instructor must be obtained before enrollment.

*148A–148B. Actuarial Science. (3–3) Yr. M W F, 8. LESLIE
The mathematical theory of insurance. The consent of the instructor must be obtained before enrollment.

Transportation and Foreign Trade

Course 173 is prerequisite to courses 174 and 175.

*170. Staple Commodities of World Trade. (3) II. KINCAID
M W F, 10.
A study of the leading commodities of world trade with reference to the extent of production and prominence in world trade and the characteristics which give them this prominence.

*171. Geography of International Trade. (3) I. M W F, 10. KINCAID
In 1921–22 this course will deal with the economic geography of countries on the Pacific Ocean, particularly with reference to the geographic characteristics of those countries in so far as they relate to products which enter into international trade.

*174. Railway Traffic. (3) II. M W F, 3. DAGGETT
Railway organization, forms, accounts, rates and rate construction.

175. Railroad Regulation. (3) II. M W F, 3. DAGGETT
Mainly concerned with the Interstate Commerce Act.

178. International Trade. (3) I. M W F, 3. DAGGETT

179. Ocean Transportation. (3) II. M W F, 2. DAGGETT

GRADUATE COURSE

207A–207B. Seminar in Accounting Problems. (2–2) Yr. HATFIELD

COURSES IN OTHER DEPARTMENTS

Japan and Her Makers [Oriental Languages, 109A–109B].
Commerce and Industry in Japan [Oriental Languages 121A–121B].
Social and Economic Conditions of China [Oriental Languages 128A–128B].
Commerce and Industry in Russia [Slavic Languages 50].
History of Hispanic America from 1808 [History 162A–162B].
History of Mexico [166A–166B].
Principles of International Law [Jurisprudence 103A–103B].
Admiralty [Jurisprudence 244].
Construction and Operation of Ships [Marine Engineering 106A].

* Not to be given, 1920–21.

Digitized by Google

EDUCATION

Department Staff

ALEXIS F. LANGE, Ph.D., Professor of the Theory and Practice of Education and Director of the School of Education.
RICHARD G. BOONE, Ph.D., Professor of Education.
†WILLIAM W. KEMP, Ph. D., Professor of School Administration.
CHARLES E. RUGH, M.L., Professor of Education.
ROBERT J. LEONARD, Ph.D., Professor of Vocational Education and Director of the Division of Vocational Education.
CYRUS D. MEAD, Ph.D., Associate Professor of Elementary Education.
J. V. BREITWIESER, Ph.D., Associate Professor of Education.
W. SCOTT THOMAS, A.B., Assistant Professor of Education.
RICHARD S. FRENCH, Ph.D., Assistant Professor of Education.
JOHN S. BOLIN, M.A., Associate in Education.
HARVEY L. EBY, A.B., Teaching Fellow in Rural Education.
LEROY E. COWLES, M.A., Teaching Fellow in Vocational Education.

Supervisors of Student Teachers in the University High School

EDNA W. BAILEY, Ph.D., Supervisor of the Teaching of Science.
EMMA J. BRECK, Ph.B., Supervisor of the Teaching of English.
HIRAM W. EDWARDS, Ph.D., Supervisor of Physical Sciences.
FLORENCE LAGANKE, Supervisor of the Teaching of Household Economics.
JULIETTE LEVY, B.L., Supervisor of the Teaching of Modern Languages.
LOUISE PATTERSON, A.B., Supervisor of the Teaching of Physical Education.
SAIDEE STURTEVANT, M.A., Supervisor of Girls' Activities.

Fees.—A book fee of $1.50 will be charged in the following courses: 101, 121, 126, 141, 143, 200, 319, and 320.

PREPARATION FOR THE MAJOR

Required: junior standing or junior college diploma.

LOWER DIVISION COURSE

*11. Education and Culture. (1) I. M, 4. BOLIN
Stereopticon lectures on the evolution of educational thought and practice.

UPPER DIVISION COURSES

History of Education

101. The History of Education: General Course. (3) Either half-year. FRENCH, BOLIN
I, four sections: Sec. 1 (French), M W F, 8; Secs. 2, 3 (Bolin), M W F, 10, 3; Sec. 4 (Bolin), M W Th, 11. II, three sections, hours to be arranged.
The development of educational thought and practice viewed as a phase of social progress.

† Absent on leave, 1920-21. * Not to be given, 1920–21.

Digitized by Google

102. The History of American Education. (2) Either half-year.
BOONE, EBY
I, Sec. 1 (Boone), M W F, 8; Sec. 2 (Eby), M W F, 3. II, hours to be arranged.
A historical study of the leading ideas and ideals of American education and of the institutions in which they have been embodied.

103. The History of Elementary Education. (3) I. M W F, 9. MEAD
With emphasis on the work of Rousseau, Pestalozzi, Herbart, Froebel, and more recent educators.

104. History of Vocational Education. (2) I. Tu Th, 3. ——
Prerequisite: course 101, or 102, or 103.

Theory of Education

111. The Period of Adolescence. (3) I. M W F, 3. BREITWIESER
A study of the mental and physical states during the adolescent period in their relation to secondary education.

112. Psychological Aspects of Education. (3) I. BREITWIESER
M W F, 2.
A study of biological and psychological laws in their application to education.

113. Social Aspects of Education. (3) II. M W F, 2. BREITWIESER
The application of social psychology to education. The aims and purposes of the individual in society and educational groups.

120. The Theory of Education. (3) Either half-year. LANGE
I, M W F, 8; II, M W F, 9.
A study of fundamental principles, processes, and methods, with special reference to national culture and ideals.

121. The Principles of Secondary Education. (3) Either half-year.
BOONE, FRENCH, BREITWIESER
I, three sections: Sec. 1 (Boone), M W F, 10; Sec. 2 (French) M W F, 4; Sec. 3 (——), M W F, 3.
A study of the theoretical and the broader practical aspects of the secondary state of education, with special reference to the American high school system.

122. The High School. (2) I. THOMAS
Three sections: M W F, 2, 3, 4.
A study of the concrete problems of the high school, with reference to questions of aims, curriculum, instruction, and management.

123. The Principles of Elementary Education. (3) Either half-year.
M W F, 10. MEAD
For students preparing for elementary school service, or secondary certification, and for normal school graduates who wish to take advanced work in the field of elementary education.

124. Moral Education. (2) II. Tu Th, 8. RUGH
The moral life as a personal response to the social order. The school as a means of moral education.

Digitized by Google

125. Problems of Moral Education. (2) Either half-year. RUGH
Tu, 4–6.

Special study of training for citizenship in a democracy. Admission only on consultation with instructor.

126. An Introduction to the Study of Atypical Children. (2) I.
Tu, 4–6. FRENCH

A study of the social and psychological problems involved in the teaching of the deaf, the blind, the mentally subnormal and specially "gifted" children. Individual problems assigned. Admission only on consultation with the instructor. Method that of pro-seminar.

127. Psychology of High School Subjects. (2) I. BREITWIESER
Tu Th, 2.

School Organization and Administration

Course 141 or teaching and administrative experience is prerequisite to courses 142 and 143.

140. School Systems. (3) I. Tu Th, 10; S, 8. THOMAS

The development and present status of typical European systems of education, particularly those of Germany, France, and England.

141. The Administration of Public Education. (2) Either half-year.
M W, 3. ——

142. Contemporary Movements in Education. (2) I. ——
Th, 7:30–9:30 p.m.

A survey of educational discussion and practice, touching on urgent administrative problems of the day. Designed primarily for advanced students with teaching experience who desire to prepare for the administrative side of school work.

143. Problems in the Administration and Supervision of Schools Based on School Surveys. (2) II. Tu, 7:30–9:30 p.m. ——

Designed primarily for advanced students with teaching experience who desire to prepare for the administrative side of school work.

144. Rural School Organization and Administration. (2) I. EBY
Tu Th, 3.

A survey of the several types or units of rural school organization, and of the problems of rural school administration, with special reference to a more complete adjustment of the rural schools to rural needs. Designed particularly for those who are looking forward to rural school administration. Open to seniors and graduates who have had a course in the history of education and in the theory of education.

145. Rural School Supervision. (2) II. Tu Th, 3. EBY

A study of the specific problems of rural school supervision and the means and methods of such supervision. Designed for those who are preparing for rural school supervision. Open to seniors and graduates who have completed courses in the history of education and in the theory of education.

Digitized by Google

146. The Intermediate (Junior High) School. (2) II. M W, 11. MEAD

The development of the movement and the specialization of work for the intermediate school.

*147. The American University-College. (2) II. LANGE

The evolution, character, and function of the American university as an organ of the body politic; its organization in the light of its inherent purposes; curricula and instruction; the meaning of academic citizenship; relation of student activities to university aims; progressive policies; the Junior College movement. Lectures, discussions, debates.

*148. The Organization and Administration of Special Institutions for "Defective" Classes. (2) II. Tu, 4–6. FRENCH

Admission only on consultation with the instructor.

Vocational Education

160. Vocational Education. (3) Either half-year. M W F, 8. COWLES

The history, meaning, and organization of vocational education; state and federal legislation, including the Smith-Hughes act; development of state systems and principles underlying education for industry, commerce, agriculture, women's occupations and home economics. Admission only on consultation with the instructor.

161. Problems in Vocational Education. (2) Either half-year. Tu Th, 4. LEONARD

Consideration of special problems including legislation, part-time and continuation schools, evening schools, and the organization of courses of study for industrial, commercial, agricultural, and household occupations. During the second semester special consideration will be given to junior high school problems.

162. Introduction to Research in Vocational Education. (2) Either half-year. Tu, 4–6. COWLES

Review of occupational studies and vocational surveys giving critical attention to methods employed and organization and interpretation of data. Special study.

163. Content and Technique for Supplemental Subject Teachers. (2) Either half-year. S, 10–12. JACOBS

This course is designed for teachers in the field as well as for university students. It is intended for those who are preparing to teach in a trade or industrial school subjects which are supplemental to the trades and industries. Such subjects include English, mathematics, science, drawing, hygiene, civics, history, design, and textiles.

A study of the methods of teaching, classroom management, schemes of correlation and methods of determining appropriate subject matter for trade and industrial classes.

Required of candidates for the recommendation for the special teaching certificate issued by the State Board of Education qualifying one as a teacher of Smith-Hughes Vocational Education subjects.

---

* Not to be given, 1920–21.

Digitized by Google

164A. Advanced Industrial Practice. (4) I. S, 1–5. JACOBS

164B. Advanced Industrial Practice. (4) II. S, 1–5. JACOBS

Continuation of 164A. Open only to students who have qualified or are qualifying in courses 163 or 164A, or their equivalents.

165. Commercial Education in Secondary Schools. Either half-year. M W F, 9. ——

Pro-Seminar

199. Pro-Seminar. Research Method in Education. (2) Either half-year. Tu Th, 11. LANGE

Prerequisite: at least two of the preceding courses. Admission only on consultation with the instructor. In lieu of this course students may offer Education 125, or 126, or 143, or 161, or 162, or 302.

Principles and processes of interpretation and explanation; types and criteria of procedure; adequate exposition; the scientific monograph. The emphasis of the course falls on training in scholarly application.

GRADUATE COURSES

Research Courses

200. Educational Seminar. (2) Either half-year. LANGE M, 7:30–9:30 p.m.

Topics change from year to year. Admission only on consultation with the instructor.

201. Public Administration of School Systems, Seminar. (2) Either half-year. M, 7:30–9:30 p.m. ——

Admission only on consultation with the instructor.

202. Seminar in Vocational Education. (2) Either half-year. LEONARD Sec. 1, topics of interest to those enrolled, W, 4–6; Sec. 2, topic, "Compulsory Part-Time Education," F, 7:30–9:30 p.m.

Admission only on consultation with the instructor.

203. Research Course in the History of Education. (2) II. ——

204. Society and Education. (2) I. ——

Social phases of education, including an intensive study of one or more of the great treatises on the subject of education from the social viewpoint. The particular author to be studied will be selected after consultation with the class.

205. School Organization. (2) II. Th, 7:30–9:30 p.m. LANGE

The parts of the state school system and their articulation, with special reference to secondary education in California. Admission on consultation with instructor.

207. Measurement of Elementary School Work. Seminar. (2) Either half-year. M, 7–9 p.m. MEAD

For graduates, teachers, supervisors, principals and superintendents who wish to learn the elements and technique of present day testing of materials, methods, and class products, with the application of the same to the improvement of instruction. Admission on consultation with instructor.

Digitized by Google

208. Application of Psychology. Seminar. (2) Either half-year. Tu, 7:30–9:30 p.m. BREITWIESER

For advanced students in education who have a good foundation in general psychology. The topics will deal with the applications of psychology in special fields of general and vocational education.

209. Educational Statistics. (2) II. Tu, 4–6. BREITWIESER

A study of statistical methods in education with practical problems.

297. Special Studies in the Administration of Vocational Education. LEONARD

Open only to students of maturity and experience who have completed the basic courses in education and vocational education. The work will be designed to meet the needs of those enrolled and may include research and service in vocational bureaus, schools, shops, stores or factories. A conference period of at least two hours each week will be provided.

298. Special Studies. FRENCH and the Department Staff

This course offers an opportunity for individual or for group study of the seminar type under different members of the departmental staff. Only students of proved ability may register for individual work. Groups may be formed under approved leadership for the study of current problems in education. Individual students must report regularly to the instructor in charge in accordance with a plan approved at the beginning of their work. Groups will be reported through their leaders. Not more than two units of credit will be given except with the formal approval of the Department of Education. A list of problems in education may be secured on application.

This course may be accepted in fulfillment of the requirement for seminar or research credit toward a higher degree or a high school teacher's recommendation with education as a major, only by formal action of the Department of Education.

Admission only on consultation with the instructor in charge. Hours to be arranged.

299. Thesis for the Master's Degree. Department Staff

Professional Method Courses

300. Introduction to Educational Method. (2) I. Tu Th, 3. RUGH

The school subjects, their nature and subdivisions into lessons; the nature, place and assignment of the lessons; the recitation; principles of explanation applied to high school subjects.

301. Principles of Study and Presentation. (2) I. S, 9–11. THOMAS

A consideration of the psychological fundamentals of study and its directions; typical processes in their relation to educational theory.

302. Problems in Elementary Education. (2) Either half-year. MEAD S, 10–12.

Primarily for teachers in service, and principals or administrators, and for normal school or college graduates. Problems or projects of special interest to the individual will be studied after the pro-seminar method.

Digitized by Google

*303. Language and Literature in Secondary Schools. (3) I. LANGE
M W F, 9.

Language and literature as educational means; principles, material, and methods of instruction; the arts of interpretation and translation; practical exercises, oral and written.

304. General Science in the Secondary Schools. (2) Either half-year. Tu Th, 4. EDWARDS

305. Methods of Instruction in the Physical Sciences. (2) Either half-year. W F, 4. EDWARDS

306. Methods of Instruction in the Biological Sciences. (2) Either half-year. W F, 4. BAILEY

307. Methods of Instruction in English. (3) Either half-year. M W F, 3. BRECK

This course is listed also as English 307.

309. Methods of Instruction in French and Spanish. (2) Either half-year. Tu Th, 4. LEVY

314. Methods of Instruction in Physical Education for Women. (2) Either half-year. Tu Th, 4. PATTERSON

315. Methods of Instruction in Home Economics. (2) Either half-year. Tu Th, 4. LAGANKE

316. Methods of Instruction in Commercial Branches. (2) Either half-year. Tu Th, 4. ——

319. School Management. (1) Either half-year. Th, 4. RUGH

320. Directed Teaching. (4) Either half-year. RUGH and Supervisory Staff

Subject conferences, M, 4; general conference, W F, 4; supervision conference, M, 7 p.m.

Teaching and observation of teaching under the management of the director and supervisors of the University High School. The teaching ordinarily requires one hour daily for five days per week, but students are expected to have two consecutive hours between 9 and 3 o'clock in order to facilitate the teaching assignment. Required of all candidates for the Teacher's Recommendation whose pedagogical training is taken at this University.

Unless exempt under the rules of the State Board of Education, all candidates for a teacher's recommendation must file their applications for directed teaching with the instructor in charge of course 320. As far as practicable and necessary, directed teaching courses in agriculture will be accepted as substitutes for this course. Special arrangements may be made in exceptional cases.

321. Supervision of Social Organization and Control of Secondary Schools. (2) I. Tu Th, 3. STURTEVANT

Intended for seniors and graduate students interested in extra-curricular activities.

322. Problems and Methods in Procedure for Advisors of Girls. (2) II. Tu, 4–6. STURTEVANT

Intended for those interested in training and supervision of girls in secondary schools.

* Not to be given, 1920–21.

Digitized by Google

ENGLISH

CHARLES MILLS GAYLEY, Litt.D., LL.D., Professor of the English Language and Literature.
CORNELIUS B. BRADLEY, M.A., Professor of Rhetoric, Emeritus.
WALTER M. HART, Ph.D., Professor of English.
CHAUNCEY W. WELLS, A.B., Professor of English.
BENJAMIN P. KURTZ, Ph.D., Professor of English.
THOMAS F. SANFORD, A.B., Associate Professor of English.
HAROLD L. BRUCE, Ph.D., Associate Professor of English.
ROBERT P. UTTER, Ph.D., Associate Professor of English.
ARTHUR G. BRODEUR, Ph.D., Assistant Professor of English.
ROBERT W. GORDON, A.B., Assistant Professor of English.
SAMUEL J. HUME, M.A., Assistant Professor of Dramatic Literature and Art.
GEORGE A. SMITHSON, Ph.D., Assistant Professor of English in the Extension Division.
LEONARD BACON, A.B., Assistant Professor of English.
BENJAMIN H. LEHMAN, Ph.D., Assistant Professor of English.
ALWIN THALER, Ph.D., Assistant Professor of English.
GUY MONTGOMERY, M.A., Instructor in English.
CHARLES H. RAYMOND, A.B., Instructor in English.
WILLIAM W. LYMAN, Jr., M.A., Associate in Celtic and English.
ADOLPH E. ANDERSON, A.B., Associate in English.
MARY L. KLEINECKE, A.B., Associate in English.
ROBERT H. CLARK, A.B., Associate in English.
IOLA G. RIESS, M.A., Assistant in English.
R. E. SWEETLAND, A.B., Assistant in English.
MABEL BAIRD, A.B., Assistant in English.
Six Teaching Fellows.

EMMA J. BRECK, Ph.B., Lecturer in the Teaching of English.
ROBERT HUNTER, A.B., Lecturer in Economics.

Information for Lower Division Students

The examination in Subject A is prerequisite to all sections of English 1. English 1A–1B or Public Speaking 1A–1B is prerequisite to a major in English.

Upper division courses are open to all students who have the permission of the instructors in charge.

A fee of $1 per half-year is required of all students enrolled in English 1.

Information for Upper Division Students

Systematic Study.—Students who wish to undertake systematic study in the upper division must have completed English 1A–1B or Public

Digitized by Google

Speaking 1A–1B. The 12 units of upper division courses which by university regulation must be chosen from one department may be made up from any upper division courses. But all who desire to engage in comprehensive and thorough study, whether for general or professional purposes, should meet the following conditions:

1. Students must present, ordinarily in the first term of the junior year, a programme to be examined and approved by the department. The programme, however, may be amended from time to time after consultation with the department.

2. The programme should cover 24 units of upper division courses, and must be approved by the chairman of the Committee on Upper Division Studies.

3. Normally the courses constituting the 24 units should be drawn from the list of courses in English; but the department may be willing to accept units from other departments, especially from the Department of Public Speaking. Such substitutions will be permitted only when the student has received the consent of the chairman of the Committee on Upper Division Studies. Attention is called to the following courses, which are more or less directly related to the courses offered by the Department of English: French 120A–120B; Slavic 30; Spanish 105A-105B; German 210A–210B; History 151A–151B.

4. The student must pass, at the end of the senior year, English Final Examination No. II (History of the Literature).

Honors-Students in the Upper Division.—A student in the upper division who has received honorable mention with the junior certificate may be registered as a candidate for honors provided 12 of the 48 units on which the honorable mention was based consist of courses in English.

Students who complete the programme of systematic study with distinction are eligible to receive honors. No special honors-courses are at present offered by this department, but in certain upper division courses students who are candidates for honors in English may arrange with the instructor for additional credit, the amount of which will be determined by the instructor after he has outlined with the student the additional work to be done. The assignment, which should be entered on the student's study-card as English 199, will involve no additional class exercises, but occasional conferences with the instructor.

Teachers' Recommendations and Higher Degrees.—See the Announcement of the Graduate Division.

Lower Division Courses

A. Elementary English Composition (no credit). Either half-year.
Sec. 1, M, 4; Sec. 2, Th, 8. Kurtz and Readers

Prescribed for all students who receive grade 4 or 5 in Subject A. One hour per week, with written exercises and conferences. Students must continue the course until they have passed Subject A.

1x. English Composition. (3) Either half-year.
Bruce, Lehman, Thaler, Montgomery, Kleinecke
M W F, 8, 9, 10; Tu Th S, 8, 9; Tu Th, 1, 2, and a third hour.

Prescribed for all students who have received grade 3 in Subject A. Practical exercises in effective writing and speaking.

Digitized by Google

1A–1B. Advanced English Composition. (3) Either half-year.
BRUCE, UTTER, LEHMAN, THALER, LYMAN, ANDERSON, CLARK, RIESS, BAIRD

Open to students who have received grade 1 or 2 in Subject A or in English 1x. Designed for students in Letters and Science, but open to others. Oral and written discussion, based on a study of selected authors.

1A. M W F, 9, 1, 2, 3; Tu Th S, 9, 10.
1B. M W F, 8, 9, 10, 1, 2; Tu Th S, 8, 9, 10.

1C–1D. English in Business Practice. (3) Either half-year.
RAYMOND, SWEETLAND

Open to students who have received grade 1 or 2 in Subject A or in English 1x. Designed for students in Commerce and Agriculture, but open to others. Special emphasis will be placed upon precision and directness of expression.

1C. M W F, 9, 1.
1D. M W F, 8, 10.

1F. English for Foreigners. (3) Either half-year. M W Th, 11. BAIRD

Open to students who have the consent of the instructor.

3A–3B. Introduction to the Study of Poetry. (3–3) Yr. KURTZ
M W F, 9.

This course is designed to afford a historical perspective of European poetry and an introduction to the principles of criticism. It is offered both for those who desire a general acquaintance with poetry and for those who intend to select a European literature as a major. Lectures, reading of masterpieces in translation, frequent examinations.

4C–4D. Great Books. (1–1) Yr. F, 4. GAYLEY

Lectures, reading and reports. The course is given in series, each of which may be taken once. In 1920–21 the subject will be Twentieth Century Literature.

UPPER DIVISION COURSES

Composition

101D. Advanced English in Business Practice. (3) Either half-year.
W, 7:30–9:30 p.m. and a third hour. RAYMOND

101E. Advanced English in Business Practice. (3) Either half-year.
M W, 11, and a third hour. RAYMOND
Continuation of 101D.

105. Critical Writing. (3) II. W, 2–4, and a third hour. BRUCE

Theory and practice of critical writing. Contemporary books and reviews will form the chief basis of discussion.

106B. Frequent Writing. (3) Either half-year.
UTTER, LEHMAN, ANDERSON

Tu Th, 3, and a third hour; M W F, 4.

For six weeks, daily one-page exercises; thereafter less frequent and longer pieces. Class discussion of technique; appointments for individual criticism.

Digitized by Google

106E. Essay Writing. (3) I. M W F, 3. WELLS
Prerequisite: course 105 or an equivalent.

Training in advanced exposition, oral and written; fortnightly compositions, with frequent *précis* and short essays. Class-study of a topic of present-day interest as a basis for writing: in 1919, *American Traits;* in 1920, *Journalism.* Limited to those who have the consent of the instructor.

106F. Essays in Literary Backgrounds. (3) II. M W F, 3. WELLS
Prerequisite: course 105, or 106E, or an equivalent.

Composition oral and written, based on a survey of the historical, social and literary background of literature. In 1919, *The Elizabethan Age;* in 1920–21, *The American Literary Background.* Limited to those who have the consent of the instructor.

106H. Frequent Writing. (3) II. LEHMAN
Tu, 7:30–9:30 p.m., and a third hour.

A continuation of English 106B. Limited to those students who have the consent of the instructor.

106M–106N. English Verse Composition. (3–3) Yr. BACON
Tu Th, 10, and a third hour.

One lecture a week on the theory of verse and two hours of criticism on work submitted by members of the class. A long poem or a series of poems must be submitted at the end of the term. Open to all students who have the consent of the instructor.

Principles of Literature: Interpretation and Criticism

109A. The Theory of Poetry; History and Principles. (3) I. KURTZ
M W F, 10.

From Plato to Hegel, with constant reference to the bases in poetry.

109D. Problems of Literary Criticism. (3) II. KURTZ
M W, 11, and a third hour.

The characteristics and development of literary types: in 1921, the English Elegy.

*109E–109F. Problems of Literary Criticism. (3–3) Yr. KURTZ
M W F, 10; M W F, 9.

(E) The beginnings of poetry: analysis and classification.

(F) The beginnings of song: analysis of structure with special reference to the differentiation into types.

History of the Language

Course 110A–110B, as a general survey, is recommended to all serious students of literature. It is, however, especially adapted to the needs of prospective teachers. Courses 111A, 111B, 111C and 111D form a sequence dealing with the language and literature down to 1400. Although the work in these courses is, of necessity, largely linguistic, it is concerned

* Not to be given, 1920–21.

Digitized by Google

also with the literature as such, and aims to study the masterpieces read as literary types and in connection with the life of the times that produced them. Throughout the sequence there is progressive training in the methods of literary and linguistic research. Courses 212A and 212B comprehend a more intensive investigation of the origin and growth of the language and afford a basis for graduate research in linguistics.

110A–110B. General Introduction to English Philology. (3–3) Yr. Tu Th S, 8. BRODEUR
Prerequisite: some acquaintance with Latin or German.

(A) The origins of language; the relation of language to thought; the life and growth of English.

*(B) The history of English uses; the development of English sounds, of English grammar, and of prose style. The evolution of words; phrasal growth; the order and structure of the sentence.

110D. English Grammar. (3) II. Tu Th S, 8. UTTER

*111A. Old English. (3) I. Tu Th S, 9. ——
During 1920–21 the subject matter of course 111A will be incorporated into course 212A.

111B. Middle English. (3) II. Tu Th S, 9. THALER
Prerequisite: course 111A.

111C. Chaucer. (3) I. Tu Th S, 9. BRODEUR
The Canterbury Tales.

*111D. Chaucer. (3) II. Tu Th S, 10. ——
Troilus and Criseyde, The House of Fame, The Legend of Goode Women, the Parlement of Foules.

Drama: History, Construction, Criticism

114A–114B. The Elizabethan Drama. (3–3) Yr. M W F, 10. SANFORD
The principal dramatists from the accession of Elizabeth, 1558, to the closing of the theatres, 1642. (A) Lyly to Jonson; (B) Jonson to Shirley. Lectures and collateral reading.

114C–114D. Play Construction and the Modern Theatre. (3–3) Yr. Tu, 10–12; Th, 10. HUME
Lectures and readings, with reports by the students. Lectures on various phases of the modern theatre and play production. Stage decoration, community drama, pageantry, etc. Practice in play writing. Discussion and criticism of the plays in class. Limited to students who receive the consent of the instructor.

114E–114F. Advanced Play Construction and the Modern Theatre. (3–3) Yr. M W F, 10. HUME

114G. Restoration and Eighteenth Century Drama. (3) I. M W F, 3. THALER

*117A–117B. Shakespeare. (3–3) Yr. M W F, 9. HART
The reading and interpretation of selected plays.

* Not to be given, 1920–21.

Digitized by Google

117E–117F. Shakespeare. (3–3) Yr. M W F, 2 GAYLEY

Lectures. A presentation of the life, customs, and ideals of Shakespeare's age, based upon the study of a number of his plays and some of the works of his contemporaries. Special assignments adapted to advanced students.

The attention of all students specializing in the drama is called to the following courses offered in other departments:

Greek 104. Greek Drama.

French 120A–120B. Classical Drama.

Spanish 105A–105B. The Modern Drama.

Slavic 30. Russian Novelists and Dramatists of the Nineteenth Century.

Public Speaking 10A–10B. Dramatic Interpretation.

Public Speaking 118A–118B. Acting as an Art and as a Method of Interpretation.

Graphic Art 1A–1B. General History of Art.

Music 3A–3B. Introduction to the History of the Modern European Art of Music.

Historical and Critical Study of the Literature

102A–102B. History of English Literature. (3–3) Yr.
SANFORD, MONTGOMERY

A course for juniors and seniors in the study of the history of English literature and in the critical reading of illustrative masterpieces. Conducted without lectures or recitations. Weekly assignments. Two mid-term three-hour examinations and a final examination. The class will meet for organization on the evening of the first Wednesday of each half-year.

*115A. Elizabethan Poetry. (3) I. M W F, 10. SANFORD

The literature of the sixteenth and seventeenth centuries from Elizabeth to the Restoration (1558–1660). Lectures and reports on assigned reading. Open only to students in the upper division and to graduates.

*115B. Spenser. (3) II. M W F, 10. SANFORD

Intensive study of the complete works of Spenser with incidental reference to the history of his times and to his Classical and Renaissance sources.

*115C. Elizabethan Prose. SANFORD

Intensive study of selected major prose writers of the sixteenth and seventeenth centuries, from Lyly to Dryden. Open only to students in the upper division and to graduates.

115D. English Prose from Malory to Bacon. (3) II. GORDON
Tu Th S, 9.

A survey of English prose during the period of the Renaissance and Reformation and to the death of Queen Elizabeth, with special attention to the life and history of the times. Lectures, collateral reading, and examination.

* Not to be given, 1920–21.

Digitized by Google

*116A–116B. The Bible in English Literature. (3–3) Yr. M W F, 2. GAYLEY and a Reader

Literary types; qualities of thought and style; careful study of selected books. Lectures, reports, and frequent examinations.

118. The Age of Milton. (3) I. M W F, 2. BACON

*119A. Restoration Literature. (3) II. M W F, 1. SANFORD

The literature of the Restoration Period (1660–1700). Lectures and reports on assigned reading. Open only to students in the upper division and to graduates.

*119B. Eighteenth Century Poetry. (3) II. M W F, 10. GORDON

Lectures on the poets from Pope to Wordsworth. Collateral reading and reports.

119C. Eighteenth Century Prose. (3) I. Tu Th S, 9. GORDON

Lectures on the major prose authors, with collateral reading and reports. Open only to students in the upper division and to graduates.

119F–119G. Johnson and His Circle. (3–3) Yr. Tu Th, 3, and a third hour. BACON

120A–120B. English Satire from Bishop Hall to Thackeray. (3–3) Yr. M W F, 9. MONTGOMERY

Lectures and class discussion upon the origin and development of verse-satire in England. Individual investigation of problems in social, political, and literary satire. Pro-seminar. Limited to students of at least junior standing.

121A–121B. Nineteenth Century Poetry. (3–3) Yr. M W F, 9. SANFORD

Lectures and collateral reading. (A) Wordsworth to Tennyson; (B) Tennyson to Swinburne. Open only to students in the upper division and to graduates.

*121E–121F. Later Victorian and Georgian Prose. (3–3) Yr. W, 4–6, and a third hour. GAYLEY

Intensive study of selected masterpieces dealing with problems of critical, philosophical and political thought. Topics assigned for investigation. Theses and oral discussions. Open to seniors and graduates whose major is English; also to those who take it as Oral Debates upon Literary Topics as a sequel to Public Speaking 110A-110B. Limited to twenty students.

*122A–122B. Browning. (3–3) Yr. M W F, 2. SANFORD

A systematic and intensive study of the works of Browning. (A) Introduction to Browning. Life and letters, poetic principles, theory of life, and minor poems. (B) Research course in the major poems and dramas. Lectures and interpretations. Open only to students in the upper division and to graduates.

123B. Liberal Thought in English Literature. (3) II. M W F, 10. BRUCE

The development of social ideals, as expressed in English literature from the French Revolution to the present.

---

* Not to be given, 1920–21.

Digitized by Google

124B. Shelley, Keats, and Tennyson. (3) II. M W F, 10. KURTZ
An intensive study of selected poems.

*125A–125B. The Development of Narrative Art. (3–3) Yr. HART
M W F, 10. Book fee, twenty-five cents each half-year.
Lectures on the history of the briefer form of narrative from the beginnings to Kipling.

125C. Criticism of the Novel. (3) II. M W F, 2. WELLS
Lectures on the types of prose fiction, from the saga and early romance to the present-day novel. Ten books to be read and a brief critique to be written on each book. May be taken both as study of literature and as practice in advanced composition. Limited to those who have the consent of the instructor.

*127. The Anglo-Celtic Poets. (3) I. Tu, 2; Th, 2–4. LYMAN
The poets of the so-called Celtic Renaissance, centering in Yeats and the modern school of Irish writers, with an investigation of their background in Old Irish Literature. Lectures, readings and reports.

*128A–128B. Twentieth Century Poetry. SANFORD
The poets and the poetry of the period from the death of Browning (1889) to the present. Lectures; reports on assigned reading.

129. Celtic Influences in English. (3–3) Yr. M W F, 10. LYMAN
An investigation of the influence exercised upon English literature by Celtic art and ideas from the earliest times to the present day. A senior pro-seminar limited to fifteen. A reading knowledge of French or German required.

130. History of American Literature. (3) I. M W F, 2. WELLS
Prerequisite: at least junior standing.
A general review, illustrated by copious reading; lectures, reports, discussions. Introductory to course 131 and course 106F. Limited to those who have the consent of the instructor.

131A. American Authors. (3) I. M W F, 3. ANDERSON
For 1920–21, Hawthorne, Poe and Bret Harte (with special emphasis on the American Short Story).

*132. The American Novel. (3) II. M W F, 3.
A historical sketch of the American novel followed by a consideration of its more recent aims and tendencies.

140. Scottish Literature. (3) II. Tu Th S, 10. GORDON
A comprehensive view of Scottish literature from Barbour to the Union of the Crowns, including the study of texts and collateral reading with frequent lectures. The treatment will be largely from the literary and not from the philological point of view. Lectures, recitations, and examination. Open only to students in the upper division and to graduates.

* Not to be given, 1920–21.

Digitized by Google

142. Sir Walter Scott. (3) I. Tu Th S, 10. GORDON

Reading in Scott's poems, novels, and *Journal;* in *Lockhart's life;* in the periodicals; and in contemporary writers of the period 1800-1832. Lectures, frequent reports, and examination.

199. Honors Course. (1, 2, or 3) Either half-year. The STAFF

Open only to junior or senior candidates for honors. Students who elect this course propose to the department special topics or fields for individual study or research. Frequent conferences with the instructor assigned by the department and a thesis are required.

Credit of from one to three units is granted, varying with the nature and difficulty of the work. Students should arrange with the department adviser for the upper division concerning this course before filing their study-cards.

Attention is called to the instruction in English offered by the *Division of University Extension.* Such instruction may be taken by correspondence.

GRADUATE COURSES

Graduates electing these courses must have a reading knowledge of French or German.

Courses 209A, 209F, 211B, 212A, 212B, 241A–241B, 242A–242B, 244A–244B, 244C–244D, 246A–246B, 247, and 248 are open only to prospective candidates for higher degrees.

Philology

*211B. Seminar in Beowulf. (3) II.

212A. History of the English Language. (3) I. Tu Th S, 10. BRODEUR

Lectures, collateral reading, and the grammatical study of texts.

*212B. Historical English Grammar. (3) I.

The Comparative Study of Literature

209A. Beginnings of Poetry. (3) I. M W, 11, and a third hour. KURTZ

*209F. Problems of Literary Criticism. (3) II. KURTZ

M W, 11, and a third hour.

Seminar. Comparative study of deluge stories.

*240A–240B. Seminar in Literary Criticism. GAYLEY

From a study at first hand of the principal authorities. This course must be preceded by course 109 or 110.

242A–242B. Seminar in the Comparative Study of Literature. (3–3) Yr. Tu Th, 3–4:30. HART

*250A–250B. Theory of Fiction. (3–3) Yr. M F, 4–5:30. WELLS

Prerequisite: graduate standing and the consent of the instructor.

Studies in the art of narrative, its principles and structures, with special application to the three orders of narration, impersonal, personal, and fictional; investigation of special authors or selected groups of novels.

---

* Not to be given, 1920–21.

Digitized by Google

Historical and Critical Study of the Literature

223B. Social Ideals in English Letters, from Langland to Morris. (3) II. W, 7:30–9:30 p.m. HUNTER

224A–224B. Literary Problems. (3–3) Yr. GAYLEY
W, 4–6, and a third hour.

Open to prospective candidates for the Teacher's Recommendation and for higher degrees.

*241A–241B. Seminar in Literary Investigation. (3–3) Yr. GAYLEY
M, 4–6, and a third hour.

Studies in the history of English comedy.

*244A–244B. Seminar in the Romantic Movement. (3–3) Yr. SANFORD
M W, 11, and a third hour.

The Romantic Movement in the eighteenth and nineteenth centuries in Great Britain, with frequent reference to the parallel movement on the Continent. (A) Elizabethan century to Scott. (B) Nineteenth century to William Morris.

244C–244D. Seminar in the Romantic Movement. (3–3) Yr. SANFORD
M W, 11, and a third hour.

Prerequisite: a reading knowledge of French and German and graduate standing. As preparation for C–D students are advised to take courses 115B, 119A, 119B.

The naturalistic development from James Morrison to A. J. Munby. A critical and historical study of naturalistic writers from Thompson to Wordsworth (first half-year); from Wordsworth to Munby (second half-year).

246A–246B. Seminar in the English and Scottish Popular Ballads. (3–3) Yr. Tu Th, 4:30–6. GORDON

Lectures, reports, theses. Special attention given to the history of the ballad collectors.

247. English Metric. (2) II. BACON

Discussion of metre, quantity and accent. Principle of equivalence. Emphasis will be laid on the scientific analysis of verse, but the historical aspect will not be ignored.

248. Literary Circles. (3) I. W, 2–4, and a third hour. BRUCE

Seminar in the study of sources, the definition of problems, and the development of theses. In 1920: Godwin, Shelley and their circle.

251A–251B. Studies in Special Authors. (3–3) Yr. WELLS
Tu Th, 4–5:30.

Open only to prospective candidates for the Teacher's Recommendation.

* Not to be given, 1920–21.

Digitized by Google

SPECIAL COURSES

307. The Teaching of English in Secondary Schools (3) Either half-year. M W F, 3, and a fourth hour. BRECK

Primarily for graduates, but open to seniors who have the consent of the instructor. This course may not be counted towards the graduate credit required for the Teacher's Recommendation or for the Master's degree. (Beginning 1920–21, this course or its equivalent will be a prerequisite to practice teaching in English.)

260A–260B. Special Study.

The instructors in English hold themselves ready to assist and advise competent students who may propose plans of special study which meet with the approval of the department.

299. Thesis for the Master's Degree.

Department Conference. The STAFF

Alternate Fridays at 11. Open to candidates for higher degrees.

Digitized by Google

FRENCH

RICHARD T. HOLBROOK, Ph.D., Professor of French.
—— ——, Professor of Romanic Philology.
RÉGIS MICHAUD, L. ès L., Professor of French.
LESLIE M. TURNER, D. ès L. de l'Université de Paris, Associate Professor of French.
[2]JOHN T. CLARK, Ph.D., Assistant Professor of French.
PERCIVAL B. FAY, Ph.D., Assistant Professor of French.
ALFRED SOLOMON, M.A., Assistant Professor of French.
WILLIAM GIRARD, Ph.D., Assistant Professor of French.
MILUTIN KRUNICH, Instructor in Serbo-Croatian and French.
LOUIS BARNIER, A.B., Associate in French.
CAROLINE B. SINGLETON, M.A., Associate in French.
MARIE CHAMPY, L. ès L., Associate in French.
GEORGE Z. PATRICK, LL.B., Associate in French.
HENRI LANGLARD, S.T.B., Associate in French.
RAYMOND H. SCIOBERETI, A.B., Teaching Fellow in Astronomy and French.
EUGENE JORALEMON, A.B., Assistant in Romanic Languages.
C. BISSELL, M.A., Assistant in French.
JULIETTE L'HOSTIS, A. B., Assistant in French.
LEANDER PAVID, A.B., Assistant in French.

ARTHUR W. RYDER, Ph. D., Associate Professor of Sanskrit.
A. CÉCILE RÉAU, C.A.L., Lecturer in French.

Facilities.—The University Library is well equipped with standard French writings, and every effort is made to obtain the books necessary for the courses offered by the department. The most important French periodicals, and publications bearing on the French language and literature are to be found in the Library.

Honors.—No student will be admitted to candidacy for honors who has not creditably completed all the lower division courses in French, or the equivalent of these courses. The candidate's record for each half-year must include at least sixty per cent of first or second grades in all courses, and work done in the Department of French must be first grade work. The candidate must furthermore give evidence of real linguistic ability. Honors-students will be under the direct supervision of a special committee appointed by the department. Each instructor will devote special attention to the honors-candidates who are in his courses, and direct their work along lines of general reading in connection with their major subject. Candidates will be encouraged to make extensive use of the library facilities.

---

[2]In residence second half-year only, 1920-21.

Digitized by Google

The 24 units of upper division work controlled by the department should ordinarily include some courses in a Romanic language other than French. In addition to work done in courses, the candidates will be required to pass a final oral or written examination, in which they must demonstrate a reasonable acquaintance with French literature and history, an exact knowledge of the grammar, and an ability to express themselves in the language of the major subject.

Higher Degrees.—See the Announcement of the Graduate Division.

Preparation for the Major

Required: 16 to 19 units of lower division courses in French.

Recommended: Latin, Greek, English, Philosophy 3A–3B, 4A–4B, 146A-146B.

Note.—The Department of French recommends that after 1920–1921 equivalents of French A and French B be taken in the high school, or elsewhere under competent direction.

Lower Division Courses

A. Elementary French. (5) I.
Singleton, Patrick, Langlard, Champy, Pavid, L'Hostis, and other Associates or Assistants
Ten or more sections, 5 hours weekly, M Tu W Th F S, 8, 9, 10, 1, 2, 3. Students who pass in course A after having had one year of French in the high school will receive two units in addition to their matriculation credit.

B. Elementary French. (5) II.
Singleton, Patrick, Langlard, Champy, Bissell, L'Hostis, and other Associates or Assistants
Eight or more sections, 5 hours weekly, M Tu W Th F S, 8, 9, 10, 1, 2. Prerequisite: course A or two years of high school French.

C. Intermediate French. (3) Either half-year.
Clark, Réau, Singleton, Langlard, Champy, Pavid
Five or more sections, M W F or Tu Th S, 8, 9, 10; M W F, 1, 2, 3. Prerequisite: course B or three years of high school French.

D. Intermediate French. (3) Either half-year.
Clark, Réau, Singleton, Langlard
Five or more sections, M W F or Tu Th S, 8, 9, 10; M W F, 1, 2. Prerequisite: course C or four years of high school French.

5. Advanced French. (3) Either half-year.
Clark, Solomon, Girard, Ryder, Bissell
Four sections (two of which are to be conducted in French, two in English), M W F, 8, 9, 1, 2.
Selected readings of modern French authors.

6. Scientific and Technical French. (2) Either half-year. Sciobereti
Two sections: Tu Th, 11, 1. Prerequisite: at least one year of French.
Designed especially for men whose major studies are in the sciences, or who are interested in modern French scientific publications.

Digitized by Google

Upper Division Courses

All upper division and graduate courses, except course 136A–136B, are conducted mainly or entirely in French.

Required for the departmental major: a minimum of 20 units of upper division work, including 106A–106B, 109A–109B, 112A–112B. Prospective teachers should also include 300A–300B.

Recommended: 120A–120B, 121A–121B, 130A–130B, 150A–150B.

106A–106B. Grammar and Exercises Based on French Classics. (3–3) Yr. Turner, Fay, Girard, and Readers

Three sections, M W F, 8, 9, 1. Prerequisite to all other courses which are required for the departmental major.

107A–107B. Typical Comedies as Documents of Spoken French. (2–2) Yr. Tu Th, 9. Holbrook

Prerequisite: an average grade in French courses higher than 3.

109A–109B. A Survey of French Literature and Culture. (3–3) Yr. M W F, 2. Michaud

From the seventeenth century to the present time, with typical and representative readings of important classical and romantic writers.

112A–112B. The Nineteenth Century. (2–2) Yr. Tu Th, 10. Turner

(A) From Chateaubriand to Balzac. Analyses of selected plays, novels and stories, with emphasis on aesthetic values and on the general movement of ideas. (B) From Balzac to Anatole France. Analyses of works as above with, in addition, collateral readings from Taine, Renan, Faguet, Lanson.

120A–120B. The Seventeenth Century. (2–2) Yr. Tu Th, 11. Fay

(A) Selected plays of Corneille and Racine, with collateral study of Descartes, Pascal, and Bossuet. (B) Selected plays of Molière, with collateral study of Boileau, La Fontaine, La Bruyère, and La Rochefoucauld.

121A–121B. The Eighteenth Century. (2–2) Yr. M F, 3. Michaud

(A) The age of Voltaire to the end of Classicism, with special study of Fénelon, Fontenelle, Bayle, Montesquieu, l'Encyclopédie, Buffon, Voltaire. (B) The age of Rousseau and the dawn of Romanticism, with special study of Rousseau, Diderot, Bernardin de Saint-Pierre, André Chénier, and of important writers of the Revolutionary period.

125A–125B. The Sixteenth Century. (2–2) Yr. M, 4–6. Holbrook

Prerequisite: any four courses selected from 106A–106B to 121A–121B, or an equivalent, and an average grade in French not lower than 2.

Montaigne, Rabelais, Amyot, Marot, Ronsard, and others. Grammatical and lexicological studies of sixteenth-century usage; training in the elements of philological research.

129A–129B. Special Study. The Staff

Consultations in regard to individual investigations in philological or literary fields.

Digitized by Google

130A–130B. Grammar, Composition, and Style. (2–2) Yr. FAY, GIRARD
Two sections, M W, 11.
Practice in oral and written composition based on selected models.

136A–136B. Historical Background of Romanic Literature. (2–2) Yr.
Tu Th, 1. JORALEMON

140A–140B. French Thought. (2–2) Yr. Tu Th, 8. TURNER
A survey of philosophical ideas and tendencies, principally those of Descartes, Malebranche, Helvétius, Condorcet, Cousin, Lamennais, Comte, Renan, Taine, Cl. Bernard, Fouillée, Ribot, Boutroux, Bergson. Some of the lectures will be given in English. Prerequisite: ability to read French.

150A–150B. Introduction to Medieval French Literature. (2–2) Yr.
Tu Th, 2. SOLOMON
Lectures, and reading of typical works in modern French versions.

GRADUATE COURSES

Recommended: Latin, Greek, German, and Italian or Spanish.

NOTE.—Certain courses marked (*) are given in alternate years.

201A–201B. Historical Grammar. Seminar. (2–2) Yr. HOLBROOK
History of French forms, sounds, and syntax.

202A–202B. Comparative Philology. Seminar. (3–3) Yr. ——
The linguistic relations of French to Italian and Spanish.

203A–203B. Applied Phonetics. Seminar. (2–2) Yr. HOLBROOK or ——
The sounds of living French.

204A–204B. Eleventh, Twelfth Centuries. (2–2) Yr. HOLBROOK
Readings in French literature, especially designed for graduates who wish to study the French sources of early English writings: *Chanson de Roland,* Chrétien de Troyes, *Lais* of Marie de France.

208A–208B. François Villon and *Pathelin.* Seminar. (2–2) Yr. HOLBROOK

*209A–209B. French Criticism and Literary Doctrines since the Renaissance. (2–2) Yr. MICHAUD
A study of general and applied criticism especially during the classical period.

212A–212B. The Modern French Short-Story. Seminar. (2–2) TURNER
Technique; literary values; evolution. Open to graduates and qualified juniors and seniors.

* Not to be given, 1920–21.

Digitized by Google

214A–214B. French Versification. (2–2) Yr. MICHAUD

A study of the development of French verse technique since the middle ages, with special reference to present-day poets. Open to teachers and qualified seniors.

231A–231B. Literary Investigation in Comparative and especially in French and American Literatures. (2–2) Yr. MICHAUD

299A–299B. Special Study for Candidates for the M.A. or Ph.D. The STAFF

300A–300B. Course for Teachers. (2–2) Yr. Tu Th, 11. HOLBROOK

Review of grammar, study of methods of teaching French, practice in editing French texts.

Digitized by Google

GEOGRAPHY

RULIFF S. HOLWAY, M.S., Professor of Physical Geography.
BURTON M. VARNEY, M.A., Instructor in Meteorology.
RUTH E. BAUGH, Assistant in Geography.
RICHARD J. RUSSELL, A.B., Assistant in Geography.
JOHN WESLEY COULTER, A.B., Assistant in Geography.

PREPARATION FOR THE MAJOR

Required: Geography 1A, 1B, 2B, 1C, 2C.

Recommended: matriculation physics and chemistry; Economics 3A, History 4A–4B or 8A–8B, or Geology 1A.

Course 1A has been planned as a general introduction to all other courses in geography. Those who plan to specialize in the strictly physical aspects of geography should take Geology 1B and 6 in the last half of the sophomore year, as a prerequisite to Geography 102 and 118. Students who plan to specialize in historical or economic geography should consult with the chairman of the department as to necessary lower division courses in other departments. Closely related upper division work in other departments may be approved as part of the schedule for graduation. Candidates for the teacher's recommendation should consult the section on geography in the announcement of the School of Education.

Honors-students in the Upper Division.—Candidates for honors in geography must take course 118 or 127 and present a thesis on a subject related to the course taken.

LOWER DIVISION COURSES

1A. Fundamentals of Modern Geography. (4) I. HOLWAY
M W F, 8, and one section meeting. Book fee, $1.50.

Scope and problems of modern geography. Influence of geographic environment on man and his affairs. The relief and climate of the continents. Great routes for movements of peoples determined by geographic conditions. Nature and function of international boundaries. The ocean, its tides and currents, and its importance as the chief international highway. Maps, the graphic expression of the data of geography. Properties of different map projections and the uses to which they are adapted. The great problem of modern geography is the scientific investigation of the natural conditions affecting man and his work, and the mapping of such data to show their space relations.

Introduction to Economic Geography. (Economics 3A.)
Prerequisite: Geography 1A.

The relations between geography and economics.

Digitized by Google

1B. Weather and Climate. (3) II. M W F, 8. VARNEY
Syllabus fee, fifty cents.

A study of the earth's atmosphere and the changes in it which produce our weather and influence our life. Significance of weather and climate as factors in business, transportation, health, aviation and related matters. Problems involved and results achieved in combatting frosts, fogs, hurricanes, tornadoes, drought, flood, hot waves, cold waves and the like. Examples of the influence of weather and climate on human affairs will be drawn from various parts of the world, but chiefly from the two Americas. This course is introductory to the more detailed study (in course 113) of climates throughout the world and their importance as a geographic influence, and is desirable for those intending to take course 116A or 116B.

2B. Map and Instrumental Study of Weather and Climate. (2) II.
VARNEY

Laboratory, Sec. 1, W, 1–4; Sec. 2, Th, 1–4, together with observational work, readings, and a report. Course 2B open only to those taking course 1B.

Making and recording of meteorological observations. Graphic methods of studying data on weather and climate. Practical work with meteorological instruments. Weather and climatic maps and the elementary principles of weather forecasting.

1C. Elementary Physiography. (4) II. HOLWAY
M W F, 9, and one section meeting. Syllabus fee, fifty cents.

An introduction to the study and appreciation of land forms. Crustal movements and the resulting topography. Volcanoes and lava flows. Erosional forces and the processes of degradation. The evolution of topography in a geographic cycle under humid, arid, or glacial conditions. Topographic control of man's activities.

2C. Map and Field Study of Physiography. (1) II. HOLWAY, RUSSELL
Sec. 1, M, 1–4; Sec. 2, Tu, 1–4. Open to students taking course 1C. Sections limited to twenty students each. Two all-day field trips on Saturdays.

UPPER DIVISION COURSES

A lower division course in geography is prerequisite to courses 116A, 116B, 116C, 127.

102. Field Physiography. (3) I. HOLWAY
Tu Th, 10, and field trips. Eight field days, agreed Saturdays, and one trip Thursday to Saturday, inclusive. Prerequisite: elementary physiography or geology. Traveling expenses, $15 to $20.

Evolution of topography in the vicinity of San Francisco Bay. The observation and interpretation of topographic forms.

103. Special Field Studies. (1–4) HOLWAY
Additional field investigation under the direct supervision of the instructor, either during the academic year or during vacation. Open to qualified students by special permission.

Digitized by Google

113. Climatology. (3) I. VARNEY
M W F, 8. Prerequisite: course 1B or its equivalent.

A study of the factors which control climate in different parts of the world, considered especially in their relation to human activities. The climate of the United States as an illustration of climatic controls, with particular reference to California. The Friday appointment will usually be devoted to discussions of readings, map work, etc., assigned in connection with the lectures.

*115. Physiography of California. (3) II. HOLWAY

The physical features of California, with particular reference to the causes and processes involved in the evolution of topographic forms and their influence on man's activities.

116A. Geography of North America. (3) I. Tu Th S, 8. VARNEY

The topography, climate, and natural resources of North America, and their relations to the economic geography of the continent.

116B. Geography of South America. (3) II. Tu Th S, 8. VARNEY

The topography, climate, and natural resources of South America, and their relations to the economic geography of the continent.

*116C. Geography of Europe. (3) VARNEY

The topography, climate and natural resources of Europe, and their relations to the causes, conduct, and results of the Great War.

117. Relief Modelling. (1–2) I. VARNEY

Laboratory work in making relief models. Limited to four students.

*118. Advanced Physiography. (3). HOLWAY
Prerequisite: course 102.

Recent physiographic publications. A study of the principles controlling the evolution of topography. Prescribed for students whose major is physical geography.

121. Current Developments in Meteorology and Climatology. (2) II.
Tu Th, 10. VARNEY

Readings, reports and conferences on matters in the current literature of these sciences.

127. Geographic Influences in Human Affairs. (3) II. HOLWAY.
M W F, 10.

An introduction to the study of the general principles of geography involved in the influence of topography and climate upon human affairs. Prescribed for students whose major is human geography.

GRADUATE COURSES

219A–219B. (2–2) Yr. W, 3–5. HOLWAY

Students who register for field work should have at least two days free each week or, preferably, should register for summer work. This course may also include library study in collating geographical data from scientific investigations on the Pacific Coast.

* Not to be given, 1920–21.

Digitized by Google

299. Thesis for the Master's Degree.

The opportunity for research work in the physical geography of California is almost unlimited. No state in the Union has a greater variety of topographical forms and as yet practically nothing but the most general study of these forms has been made. Within a short distance of the University the coast line topography is most striking and many special problems in connection with ocean terraces and sea-cliff erosion will yield valuable results. Peculiarities of drainage, fault zone topography, and remnants of former geographic cycles are almost at our doors. Within the limits of the state, problems varying from the study of living glaciers to the erosion conditions of the most arid deserts are available for investigation by qualified students. The meteorology and climatology of the state also offer abundant work for original observations, and the extensive data collected by the Weather Bureau may be used for study in this field.

In addition to the field work sugested above, there is need for extensive research in the University Library in order that geographical data scattered throughout the various scientific reports on the geology, botany, water supply, etc., of the coast may be gathered and made available in connection with direct geographic surveys.

Opportunities are by no means confined to physical geography, for problems of equal interest in commercial geography are multiplying with the rapid growth of the coast cities and with the transportation changes under modern conditions.

Digitized by Google

GEOLOGY AND MINERALOGY

ANDREW C. LAWSON, Ph.D., Professor of Mineralogy and Geology.

GEORGE D. LOUDERBACK, Ph.D., Professor of Geology, and Dean of the College of Letters and Science.

ARTHUR S. EAKLE, Ph.D., Professor of Mineralogy.

ROY R. MORSE, B.S., Instructor in Geology.

—— ——, Instructor in Geology.

THOMAS L. BAILEY, A.B., Teaching Fellow in Geology and Mineralogy.

—— ——, Teaching Fellow in Geology and Mineralogy.

JOHN C. MERRIAM, Ph.D., Professor of Palaeontology and Historical Geology.

BRUCE L. CLARK, Ph.D., Assistant Professor of Palaeontology.

PREPARATION FOR THE MAJOR

Required: Geology 1A (3); Mineralogy 1A–1B (4); 2AB (3); Physics; Chemistry.

Recommended: Physics 1A–1B, 2A–2B or 4A–4B; Chemistry 1A–1B, 6A–6B or 5, 110; Drawing AB, C, 3D; Civil Engineering 1A–1B, 3; French; German.

Honors-students in the Upper Division.—The programmes of honors-students must be approved by the department not later than the beginning of the senior year. All such programmes must include Geology 102A–102B and Geology 112 or Mineralogy 106A–106B. Honors will be awarded on the basis of excellence in the major.

GEOLOGY

There are no laboratory deposits in this department.

LOWER DIVISION COURSES

1A. General Geology: Dynamical and Structural. (3) I. LAWSON
M W F, 9. Prerequisite: elementary chemistry and physics.

NOTE.—Students who intend to make geology a major study in the later years of their course are advised to take this course as early as possible.

1B. General Geology: Historical. (2) II. Tu Th, 10. MERRIAM.
Prerequisite: Geology 1A or Palaeontology 1.

Digitized by Google

6. Practical Work in Palaeontological Geology. (2) II. CLARK
Laboratory, M or W, 1–4; and seven all-day field trips.

Given in connection with Geology 1A. Laboratory work and excursions. For the purpose of studying a representative series of the geological horizons and of the fossils of the Coast Ranges in the field, seven excursions to points of interest near Berkeley are made on convenient Saturdays during the term. Open to students who have completed or are taking Geology 1B.

UPPER DIVISION COURSES

102A–102B. Field Geology. (2–2) Yr. Saturday, all day. LOUDERBACK
Prerequisite: Geology 103AB, which may be taken concurrently. Students taking this course may be called upon to make excursions entailing an outlay for traveling expenses of $30.

An inquiry by the student into the geological conditions which obtain in the region around the Bay of San Francisco, with occasional more extended excursions to points of special interest; training in methods of field observation and interpretation of results.

At least fifteen field days during the year. Credit in this course is given only to students who take the year's work, but supplementary credit may be given at the rate of one unit for eight days additional field work. Concurrently with the field work the class meets for lectures, exercises in geological mapping, discussion of methods, interpretation of observations and readings of geological maps.

102C. Economic Geology, Metalliferous Deposits. (3) II. LAWSON
M W F, 10. Prerequisite: Geology 1A and Mineralogy 1A, 1B.

102D. Economic Geology, Non-metalliferous Deposits. (2) I. LAWSON
Tu Th, 9. Prerequisite: Geology 1A and Mineralogy 1A, 1B.

103AB. Introduction to Petrology. (4) I. MORSE
Lectures, M W, 10; laboratory, Tu W, 1–4.
Prerequisite: Geology 1A, Mineralogy 1A and 2AB. To students in the Mining, Metallurgy, and Petroleum Engineering options in the College of Mining only one period of laboratory is prescribed, making 5 hours, 3 units credit for the course.

(A) The general characteristics, origin, mode of occurrence, and nomenclature of rocks and description of the more common types. (B) Laboratory practice in the determination of textures, mineral components, and systematic position of rocks by direct observation of hand specimens.

104A–104B. Petrographical Laboratory. (3–3) Yr. MORSE
Tu, 11; Th F, 1–4.
Prerequisite: Mineralogy 2AB; and for 104B, Geology 103AB.

(A) The optical properties of crystals and methods of investigation by means of the polarizing microscope. (B) Study of rocks with the aid of the microscope. A general introduction to practical petrology. Laboratory and lectures.

Digitized by Google

107. Physical Geology of North America. (2) II. Tu Th, 4. LAWSON
Prerequisite: Geology 1A and Mineralogy 1A, 1B.

112A–112B. Undergraduate Thesis Course. (2–2) Yr.

Credit in this course is given only to students who take the year's work.

The investigation of a problem individually chosen, with a formal report on the results. An introduction to independent research. If the subject chosen is properly approved, the completion of this course fulfills the thesis requirement for the degree of B.S. in the College of Mining. Admission to the course, hours, and subject matter must be individually arranged with the instructor under whom the student chooses to do the work.

114. Earthquakes: an Introduction to Seismology. (2) I. M W, 11.
Prerequisite: elementary physics and Geology 1A or its equivalent.

The phenomena of earthquakes in relation to physical and geological principles involved in their causation and in the methods of their investigation. Lectures.

115. Instrumental Seismology. (2) Either half-year.
Prerequisite: Geology 114.

Instrumental methods of investigating earthquakes. The care and operation of seismographs with practice in the routine work of a seismographic station. The principal types of instruments employed for earthquake registration.

116. Tectonic Geology. (2) II. Tu Th, 8. MORSE
Prerequisite: a working knowledge of descriptive geometry and Geology 1A and 102B–102B.

The phenomena of folding and faulting. Graphic solution of fault problems.

GRADUATE COURSES

210. Inorganic Geology. LAWSON

Discussions of special topics and advanced problems. Critical reviews of current literature. Prosecution or original geological research and publication of results.

209. Geology of California. (2) II. Hours by arrangement. LOUDERBACK

(A) From the earliest times to the opening of the Tertiary.

*(B) From the post-Jurassic revolution to the present time.

Lectures outlining the geological history of sedimentation, volcanic activity, the major earth movements, and geographical changes in California and bordering territory. Reviews of the literature, discussions of evidence, and field methods. Map studies and preparation of reports.

Open to graduates and seniors who have completed a course in historical geology, such as Geology 1B or 107, and a course dealing practically with rocks, such as 102A–102B or 103AB.

* Not to be given, 1920–21.

Digitized by Google

214A–214B. Advanced Laboratory and Field Work. Yr. LOUDERBACK

One or more of the following lines may be pursued: (*a*) Special methods—isolation of rock constituents, study of minerals in grains, special optical and other physical methods, chemical and micro-chemical testing. (*b*) Systematic study of a wide range of rock types with reference to literature, and critical discussions. (*c*) Special study of rocks of selected provinces with their geographical and petrological relations. (*d*) Applications of petrographical and petrological methods of study of vein and ore minerals, opaque minerals, alteration products, metasomatosis, etc. (*e*) Research. Descriptive, genetic and experimental problems. Combined field and laboratory studies. (*f*) Seminar in petrographic geology. The general topic for 1916–17 was contact metamorphism; for 1917–18, geology and petrogenesis in the desert; for 1918–19, igneous rocks; for 1919–20, sedimentation. Credit value to be fixed in each case.

299. Thesis for the Master's Degree.

MINERALOGY

LOWER DIVISION COURSES

1A–1B. Determinative Laboratory. (2–2) Yr. EAKLE, BAILEY

Sec. 1, Tu Th, 9–12; Sec. 2, M F, 1–4. Fee, $2.50 each half-year. Prerequisite: matriculation chemistry.

Practice in determination of minerals (A) by their physical properties, and (B) the use of the blowpipe and chemical reagents.

2AB. Crystallography and Crystallographical Laboratory. (3) II. EAKLE

Lectures, M W, 9; laboratory: Sec. 1, Th, 1–3; Sec. 2, F, 1–3.

Lectures on the morphology of crystals, with practice in the determination of the forms of crystals and in the methods of crystal projections.

UPPER DIVISION COURSES

103. Descriptive Mineralogy. (2) II. M W, 11. EAKLE

Lectures on the classification, properties, modes of occurrence, and uses of minerals.

Prerequisite: courses 1A, 1B, 2AB.

104. Gems and Precious Stones. (2) I. M W, 11. EAKLE

Lectures on the kinds and properties of gem minerals, their occurrences and history. Courses 104 and 105 are given alternately.

*105. Paragenesis of Minerals. (2) I. M W, 11. EAKLE

Lectures on mineral formation, associations, and synthetic production. Courses 104 and 105 are given alternately.

---

* Not to be given, 1920–21.

Digitized by Google

106A–106B. Undergraduate Thesis Course. (2–2) Yr.

The investigation of a problem individually chosen, with a formal report on the results. An introduction to independent research. If the subject chosen is properly approved, the completion of this course fulfills the thesis requirement for the degree of B.S. in the College of Mining. Hours, subject matter and admission to the course must be arranged individually with the instructor under whom the student chooses to do his work. Required of undergraduates electing a major in mineralogy.

107. Mineralogical Laboratory. Either half-year. EAKLE
Prerequisite: course 103.

One or more of the following lines of study may be pursued: (*a*) Systematic study of selected suites of minerals. (*b*) Practice in measuring and drawing crystals. Admission to the course by individual arrangement. Credit to be based on the character of the work done.

GRADUATE COURSES

In physical and chemical mineralogy, little has been done with the minerals of California, and the University collections contain an abundance of material suitable for work in these fields.

To the student who wishes to devote his attention to the genesis of minerals, their associations and their occurrences, this state offers exceptional advantages. The mineralogy of California is very incompletely known and few mineral deposits have been described. There are numerous contact zones, pegmatic dikes, veins, and dry lake deposits, all possessing a varied assortment of minerals, which afford attractive problems for investigation.

207. Advanced Crystallography. Either or both half-years. EAKLE

This course includes practical work in the measurement of crystals, the calculation of forms and the various methods of graphical representation.

208. Advanced Mineralogy. Either or both half-years. EAKLE

In this course the student is given the opportunity to obtain a wider and more thorough knowledge of minerals than is possible in the undergraduate courses. Qualified undergraduates may be admitted to the course. Subjects for theses may be chosen in either of the courses 207 or 208.

299. Thesis for the Master's Degree.

Digitized by Google

GERMAN

HUGO K. SCHILLING, Ph. D., Professor of the German Language and Literature.

ALBIN PUTZKER, M.A., Professor of German Literature, Emeritus.

J. HENRY SENGER, Ph.D., Professor of German, Emeritus.

CLARENCE PASCHALL, M.A., Professor of German.

LAWRENCE M. PRICE, Ph.D., Assistant Professor of German.

CLAIR HADYN BELL, Ph.D., Instructor in German.

FRANKLYN SCHNEIDER, Ph.D., Instructor in German.

ALICE P. TABOR, Ph.D., Instructor in German.

RALPH H. RING, M.A., Assistant in German.

PREPARATION FOR THE MAJOR

Required: German A–B (10) and C–D (6) or RC–RD (6).

Recommended: Latin, French.

Lower Division.—Two years of German in high school or five semester units of college work will ordinarily admit to course B; three years of German in high school or ten semester units of college work will ordinarily admit to courses C–D, CD, RC–RD, and SC–SD. In cases of special merit the department may grant more advanced standing.

Upper Division.—The requirement for admission to the upper division is sixteen semester units of college work or four years of German in high school. In cases of special merit admission may be granted on three years of high school German.

Honors-students in the Upper Division.—Upper division students who have completed with high standing courses A, B, CD, or their equivalent, and who have received the junior certificate with honorable mention, or who have the recommendation of the department, may be admitted, on application to the secretary of the department, to candidacy for honors. Such candidates will be required to complete with high standing an approved programme of courses including, normally, 24 units of upper division work in German. The department does not prescribe any definite programme, but it will, as a rule, insist upon a good practical command of the language, and a general knowledge of German literature. To this end, course 118A–118B will constitute a part of each programme, and likewise, unless these courses shall have been taken already in the lower division, courses 106A–106B and 106C–106D. In the case of candidates who are already well advanced in German and whose plan of study makes it desirable for them to take certain courses in allied departments, permission may be given to count such courses in partial satisfaction of the 24 units required for the major, and to count upper division courses in German taken in the freshman or sophomore years.

Master's Degree.—Candidates for the master's degree must have a general knowledge of the history of German literature, including a more

Digitized by Google

intimate acquaintance with some particular period, together with a knowledge of Middle High German.

Doctor of Philosophy.—Candidates for the degree of Doctor of Philosophy in German must present both philology and literature, one as their major, the other as a minor. Candidates whose major is philology will be examined in Gothic, Old Saxon, Old High German, Middle High German, and the history of the German language generally. Those presenting literature as a major will be examined in the history of German literature, a general knowledge of the whole field being required, together with a more detailed knowledge of one period, author, or literary type. Candidates presenting philology as a minor will be examined in Old High German, Middle High German, and the outlines of the history of the German language. The requirement for the minor in literature is a general knowledge of the history of German literature. As the second minor for those specializing in philology, either Old French, Old English, or Old Norse is suggested; for those specializing in literature, any other European literature, or else history, or philosophy.

Lower Division Courses

A. Elementary German (beginners' course). (5) Either half-year.
Paschall, Price, Bell, Schneider, Tabor

I, M Tu W Th F, 8, 9, 10; II, M Tu W Th F, 9, 10. The course corresponds to the first two years of high school German. Students who pass in course A after having had one year of German in the high school will receive two units in addition to their matriculation credit.

A^3–B^3. Elementary German (beginners' course). (3–3) Yr.

M W F, 8, 4; Tu Th S, 8. This course is exclusively for students enrolled in the colleges of Chemistry and Engineering.

B. Elementary German (continuation of A). (5) Either half-year.
Paschall, Price, Bell, Schneider, Tabor

I, M Tu W Th F, 8, 9, 10; II, M Tu W Th F, 8, 9, 10. Prerequisite: course A or two years of high school German.

Course B (or BC of 1918–19) or three years of high school German is prerequisite to courses C–D, CD, RC–RD, SC–SD.

C–D. Intermediate German (continuation of B). (3–3) Yr. Tabor

M W F, 9. Prerequisite: course B or three years of high school German.

Selections from prose and poetry, ordinarily including one of Schiller's dramas; grammar and composition. The course is conducted in German and furnishes the regular preparation for the upper division courses. It corresponds to the fourth year of high school German.

CD. Intermediate German (continuation of B). (5) II. Price

M Tu W Th F, 8. Prerequisite: course B or three years of high school German.

Digitized by Google

RC–RD. Intermediate German (prose reading only). (3–3) Yr. BELL
M W F, 1.

Selections from literary and historical prose, as a preparation for rapid reading. Course RE–RF omits all composition work and restricts the study of grammar to what is indispensable for reading. It leads up to course 107A–107B; but students who pass in course RC–RD with credit may be admitted to other upper division courses.

SC–SD. Introduction to Technical Reading. (3–3) Yr. TABOR, RING
Two sections: Tu Th S, 8, 9. If the enrollment warrants it, there will be separate sections for students in the College of Chemistry and for pre-medical students.

Course SC–SD provides special training in the reading of more or less technical texts and leads up to course 103A–103B. Students who have had course SC–SD may, however, take course 106A–106B; and they may be admitted to courses 105A–105B and 110A–110B, if they take at the same time course 106A–106B, or satisfy the department that they are not deficient in grammar and composition.

9A–9B. Outlines of the History of German Literature. (No knowledge of German required.) (1–1) Yr. Tu, 11. PRICE

Lectures (in English) and collateral reading of representative works (in English translations). This course is open to students in all departments of the University and does not require a knowledge of German. It is not intended for those who pursue the study of German beyond course 105A–105B (see course 118A–118B).

UPPER DIVISION COURSES

The courses in this group (except courses 103A–103B, 107A–107B, and 300) are conducted in German.

Four years of high school German, or course C–D, or, conditionally, RC–RD, or SC–SD is prerequisite to courses 103A–103B, 105A–105B, 106A–106B, 107A–107B, 110A–110B.

103A–103B. Scientific (Medical) German. (3–3) Yr. Tu Th S, 9. RING

Primarily for pre-medical students, but with general reading in biology, physiology, and psychology.

105A–105B. Classics of the Eighteenth Century. (3–3) Yr. PASCHALL
M W F, 9. Selected works of Lessing, Goethe, and Schiller.

106A–106B. Grammar, Composition, and Conversation. (2–2) Yr. BELL
Tu Th, 11.

106C–106D. Grammar, Composition, and Conversation. (2–2) Yr.
M W, 11. SCHNEIDER
Prerequisite: first or second grade of scholarship in course 106A–106B.

107A–107B. Rapid Prose Reading. (2–2) Yr. Tu Th, 11. BELL

Subjects of general interest in history, biography, economics, and related fields.

Digitized by Google

110A–110B. The German Ballad. (1–1) Yr. Tu, 1. SCHILLING

German ballad poetry from Goethe and Schiller to the present day.

111A–111B. Novelists of the Nineteenth Century. (2–2) Yr. SCHNEIDER

Tu Th, 9. Prerequisite: course 105A–105B, 106A–106B, 107A–107B or 110A–110B; or the former course 104A–104B.

Rapid reading of selected novels of Hauff, Freytag, Ludwig, Keller, Meyer, and others.

118A–118B. History of German Literature. (3–3) Yr. SCHILLING

M W F, 2. Prerequisite: course 105A–105B, or 107A–107B, or the former course 104A–104B.

First half-year, the Middle Ages; second half-year, from the Reformation to the death of Goethe. Lectures and discussions; collateral reading. Not open to lower division students except by special permission of the instructor.

119. Middle High German. (3) I. Tu Th S, 9. PASCHALL

Prerequisite: same as for course 118A–118B. This course should be taken together with or after (but not before) 118A–118B.

Outlines of grammar. Selections from the Nibelungenlied, the Kudrun, and the epics of chivalry.

300. German Phonology and Orthography. (1) II. W, 3. PASCHALL

150B. Special Study.

Topics selected with the approval of the department and studied privately under the direction of one of the instructors. This course is intended primarily for graduate students in absence.

GRADUATE COURSES

Prerequisite: for the literary courses, course 118A–118B; for those in philology, ordinarily, courses 119A, 106C–106D, and 121D. For advanced study in German literature a reading knowledge of Latin and French and a general acquaintance with German history is practically indispensable. For philological work some knowledge of Greek is highly desirable.

206A–206B. Composition. (2–2) Yr. SCHNEIDER

Prerequisite: first or second grade of scholarship in course 106C–106D.

Themes and essays. Practice in the correcting of written exercises. One conference a week with each student, at an hour to be appointed by the instructor. This course cannot be credited in satisfaction of the requirement of graduate work for the master's degree unless the student has already completed an equal amount of approved graduate work.

*210A–210B. English Influences upon German Literature. Pro-seminar. (2–2) Yr. PRICE

First half-year: the Eighteenth Century, with particular reference to Goethe; second half-year: Shakespeare in Germany.

---

* Not to be given, 1920–21.

Digitized by Google

212A–212B. French Influences on German Literature, especially in the Eighteenth Century. Pro-seminar. (2–2) Yr. Tu, 7:30 p.m. PRICE

*222A–222B. The Faust Legend and Goethe's Faust. (3–3) Yr. M W F, 3. SCHILLING

The inception of the idea in antiquity; its medieval forms; the Theophilus drama; the Faustbuch; Marlowe's Faustus; Calderon's Magico Prodigioso; Byron's Manfred; Ibsen's Brand; Hauptmann's Versunkene Glocke; Goethe's Faust, studied in detail.

*223A–223B. The Poems of Goethe. (1–1) Yr. SCHILLING

*225A–225B. German Literature in the Nineteenth Century. (2–2) Yr. Prose, fiction, epic and lyric poetry. TABOR

226A–226B. German Literature in the Nineteenth Century. (2–2) Yr. M W, 11. The drama up to 1880. TABOR

230A–230B. The German Drama of the Present Day. (2–2) Yr. Tu Th, 2. SCHILLING

The drama and the stage from the beginning of the naturalistic movement to the present.

Introduction to Germanic Philology. (See under Germanic Philology.)

Gothic: Grammar and Reading. (See under Germanic Philology.)

235. Old Saxon. Outlines of Germanic Metrics. (3) II. SCHILLING

*237. Old High German. (3) II. SCHILLING

*240. Historical Grammar of the German Language. (2) I. PASCHALL

242A. "Jung Deutschland" and German Intellectual Life up to the Revolution of 1848. Pro-seminar. (2) I. SCHNEIDER

242B. The Lyrics and Prose of Heinrich Heine. Pro-seminar. (2) II. SCHNEIDER

250A–250B. Germanic Seminar. SCHILLING

Original investigation in linguistic and literary fields chosen with regard to the needs and wishes of each student.

299. Thesis for Master's Degree.

---

* Not to be given, 1920–21.

Digitized by Google

GERMANIC PHILOLOGY

For the courses in English Philology see the department announcement. The courses in Germanic Philology are open to competent undergraduates, at the discretion of the instructor.

Graduate Courses

201. Introduction to Germanic Philology. (2) I. Schilling

The Indo-Germanic race, its history, and the phonology of its principal languages. The Germanic sound-shift and the phonological development of the Germanic dialects.

202. Gothic. (3) II. Paschall

Grammar, with special reference to the other Germanic dialects. Reading.

203. Old Norse. (2–2) Yr. Paschall

Outlines of the grammar; reading.

*205. Germanic Antiquities. Schilling

* Not to be given, 1920–21.

Digitized by Google

GREEK

ISAAC FLAGG, Ph.D., Professor of Greek, Emeritus.
GEORGE W. BUNNELL, M.A., Professor of Greek, Emeritus.
JAMES T. ALLEN, Ph.D., Professor of Greek.
IVAN M. LINFORTH, Ph.D., Professor of Greek.
OLIVER M. WASHBURN, A.B., Associate Professor of Classical Archaeology.
GEORGE M. CALHOUN, Ph.D., Associate Professor of Greek.
ROGER M. JONES, Ph.D., Assistant Professor of Greek.

---

[3]JOHN A. SCOTT, Ph.D., LL.D., Sather Professor of Classical Literature for 1920–21.

For a more detailed description of the courses and for the regulations concerning honors, teachers' recommendations, and higher degrees see the separate Announcement of the Department of Greek for 1920–21.

Greek studies properly include not only the language of the Greeks but all the manifestations of their genius in literature, philosophy, art, history, politics and religion. As far as possible the department of Greek, assisted by members of other departments, aims to provide instruction in all these subjects. The courses which are offered fall into two classes: (*a*) those in which a knowledge of the Greek language is required, including the courses for beginners in Greek; (*b*) those for which a knowledge of Greek is not necessary. But it cannot be too strongly emphasized that a fair knowledge of the language is essential for anything more than a superficial study of the works of the Greeks.

PREPARATION FOR THE MAJOR

Required: 1AB (5 units), 2AB (5) or 1A–1B (6), 2A–2B (6).

Recommended: Latin 1 and 5; Philosophy 3A; and a reading knowledge of French or German.

I. COURSES NOT REQUIRING A KNOWLEDGE OF THE GREEK LANGUAGE

LOWER DIVISION COURSES

The following courses do not require a knowledge of any language other than English. Courses 50, 53, 54, 55 and 64 are open to all students without exception, but at least sophomoré standing is required for the others. By special arrangement with the instructor all but 50 may be taken as upper division courses, in which case the student should register for 151B, 152, etc.

---

[3] In residence second half-year only, 1920–21.

Digitized by Google

50. The Greek Heritage. (2) I. Tu Th, 11. LINFORTH

An introduction to Greek studies, designed to acquaint the student with the time and place of Greek civilization, and to direct his attention to the several avenues by which a knowledge of this civilization may be sought: language, literature, philosophy, politics, sculpture, architecture. Primarily for freshmen. Lectures and readings.

*51A. Greek Gods and Forms of Worship. (2) I. LINFORTH
Tu Th, 11.

The Homeric pantheon, sacred shrines and festivals, forms of religious ritual, the mysteries. The course is planned as a general introduction to religious phenomena.

51B. Greek Religion and Philosophy before Plato. (2) II. LINFORTH
Tu Th, 11.

The orthodox religious tradition, Orphic and Pythagorean ideas, beginnings of physical speculation, development of ethical thought, the sophists, theological criticism, intellectual enlightenment of Athens in the fifth century.

52. Greek Government. (2) I. Tu Th, 2. CALHOUN

The governmental organization of typical Greek states with especial attention to Athens, Sparta, and the Cretan cities; reading of the more important documents (in translation). A systematic presentation of the actual forms of government, rather than a study of Greek political theory, is proposed.

53. Greek Law. (2) II. Tu Th, 2. CALHOUN

Lectures on the beginnings of Greek law, the lawgivers and the codes, the laws of Gortyn, Attic law and procedure, Greek international law, Greek law in the Hellenistic period; reading of important sources and study of cases (in translation).

54. Introduction to Greek Literature. (2) I. Tu Th, 2. ALLEN

A rapid survey of Greek literature except the drama (see course 55) from Homer to Theocritus, with special emphasis upon epic poetry and the heroic age, the development of choral lyric and the rise and significance of the several types of literary prose. Lectures, readings, reports.

55. Studies in Greek Drama. (2) II. Tu Th, 2. ALLEN

The development, significance and influence of the Greek drama: Aeschylus, Sophocles, Euripides, Aristophanes, and Menander. Lectures, readings, reports.

61. The Philosophy of Plato. (2) I. Tu Th, 10. JONES

Lectures and reports. The students will read the greater part of the dialogues (in translation).

62. Aristotle. (2) II. Tu Th, 10. JONES

Lectures on the ethics, politics, logic, and metaphysics of Aristotle. Assigned readings and reports.

---

* Not to be given, 1920–21.

Digitized by Google

64. The Literature of Ionia and the Adjacent Islands. (2) II. SCOTT
Tu Th, 10.

In this special study of the Ionic tradition in literature the Homeric poems and the histories of Herodotus will be given a prominent place.

UPPER DIVISION COURSES

*156. Greek Painting. (2) II. WASHBURN

*158. Greek Sculpture. (2) II. WASHBURN

159. Greek Architecture. (2) II. M W, 11. WASHBURN
Prerequisite: junior standing, and either Graphic Art 1A or a reading knowledge of Greek or Latin.

The historical development of Greek architecture will be studied through the existing remains, and, as far as practicable, with the help of Vitruvius and architectural inscriptions.

II. COURSES REQUIRING A KNOWLEDGE OF THE GREEK LANGUAGE

LOWER DIVISION COURSES

Students who have credit for matriculation subject 5 should take courses 101 and 102 in their freshman year. Students who have credit for matriculation subjects $5a^1$, $5a^2$ only should take courses 2A and 2B or 2AB in their freshman year and courses 101 and 102 in their sophomore year. Students who have no matriculation credit in Greek should take course 1A–1B in their freshman year and courses 2A and 2B in their sophomore year, or courses 1AB, 2AB in their freshman year.

1A. Greek for Beginners. (3) Either half-year. CALHOUN, JONES
I (Jones), M W F, 9; II (Calhoun), M W F, 2.

1B. Greek for Beginners. (3) Either half-year. CALHOUN, JONES
I (Calhoun), M W F, 2; II (Jones), M W F, 9.

1AB. Greek for Beginners. (5) Either half-year.
ALLEN, LINFORTH, CALHOUN
I, Sec. 1 (Linforth), M Tu W Th F, 9; Sec. 2 (Allen), M Tu W Th F, 3; II (Calhoun), M Tu W Th F, 3.

2A. Attic Prose. (3) I. M W F, 2. JONES
Reading in Xenophon's Anabasis; study of inflectional forms, syntax, vocabulary; exercises both in rapid reading and close analysis.

2B. Homer. (3) II. M W F, 2. JONES
Several books of the Iliad; Homeric forms and vocabulary; intelligent and expressive reading of the verse.

2AB. Attic Prose and Homer. (5) Either half-year.
ALLEN, LINFORTH, CALHOUN
I (Calhoun), M Tu W Th F, 3; II, Sec. 1 (Linforth), M Tu W Th F, 9; Sec. 2 (Allen), M Tu W Th F, 3.

* Not to be given, 1920–21.

Digitized by Google

Upper Division Courses

Courses 101 and 102 are designed to follow courses 1A, 1B and 2A, 2B, and form the proper introduction to the other upper division courses in which a knowledge of the Greek language is required. Students who have not had courses 101 and 102 should not elect any of the other courses in the following group without consultation.

100A–100B. Prose Composition. (1) Yr. JONES

101. Introduction to Plato. (3) I. M W F, 10. JONES

102. Greek Poetry. (3) II. M W F, 10. LINFORTH

Reading of selections from the Odyssey and of the Prometheus of Aeschylus. Lectures and assigned readings on the history of Greek poetry.

103. Historical Prose: Herodotus. (3). M W F, 2. ALLEN

104. Greek Drama. (3) II. M W F, 2. ALLEN

Reading of two tragedies and one comedy. Lectures and readings on the technique and presentation of Greek plays.

110. Homer. (3) I. M W F, 10. LINFORTH

Reading of books XIII–XXIV of the Iliad. The course is designed primarily to offer training in the art of reading Greek rapidly and intelligently, and to assist in the acquisition of a vocabulary. Recommended as an introduction to Professor Scott's lectures in the second half-year.

114. Plato. (3) II. M W F, 10. JONES

Reading of several dialogues such as the Gorgias, Protagoras, Meno.

199A–199B. Special Study. (1–4; 1–4) Yr. The STAFF

Each student will pursue privately some definite course of reading or investigation and will report at regular intervals to the instructor.

Graduate Courses

The following courses are intended for graduate students only, and one or more of them will be given each year, according to the needs of students. Many graduate students will find it profitable to take also some of the upper division courses for undergraduates.

212A–212B. Seminar in the Attic Orators. (2–4; 2–4) Yr. CALHOUN

The reading and interpretation of selections from the authors chosen for study; lectures on the Attic law, the development of forensic eloquence, and the several orators of the canon. To each member of the class will be assigned a problem for investigation or a portion of the text for intensive study. In the assignment of this special work the needs and tastes of the individual students will be considered, and those who do not wish to engage in a technical study of Attic law will be encouraged to choose topics related to their particular fields of interest. The private orations of Demosthenes will be studied in 1920–21; Teubner texts will be used.

Digitized by Google

*251A–251B. Seminar in Greek Religion. (2–4; 2–4) Yr. LINFORTH

253. Research Course in Greek Law. (2–3) Either half-year. CALHOUN
Open only to graduate students of Greek or of Jurisprudence. The work of the course will be conducted by informal conferences.

*255A–255B. Seminar in Greek Dramatic Representation . (2–4; 2–4) Yr. ALLEN

257A–257B. Greek Inscriptions. (2–2) Yr. WASHBURN
Practical exercises in the reading and interpretation of inscriptions of philological, archaeological, and historical interest.

Seminar in Archaeology. [See Latin 283A–283B.]

* Not to be given, 1920–21.

Digitized by Google

HISTORY

HERBERT E. BOLTON, Ph.D., Professor of American History and Director of the Bancroft Library.

EUGENE I. MCCORMAC, Ph.D., Professor of American History.

LOUIS J. PAETOW, Ph.D., Professor of Medieval History.

—— ——, Professor of Modern European History.

[1]RAUL RAMÍREZ, A.B., S.P., Chilean Exchange Professor of History.

*WILLIAM A. MORRIS, Ph.D., Associate Professor of English History.

[2]CHARLES E. CHAPMAN, Ph.D., Associate Professor of Latin-American and California History.

HERBERT I. PRIESTLEY, Ph.D., Associate Professor of Mexican History and Librarian of the Bancroft Library.

KARL C. LEEBRICK, Ph.D., Assistant Professor of History.

JOHN J. VAN NOSTRAND, Ph.D., Assistant Professor of Ancient History.

RALPH S. KUYKENDALL, M.A., Assistant in History.

BENJAMIN WEBB WHEELER, M.A., Assistant in History.

KENNETH UHL, A.B., Assistant in History.

ROLLAND VANDEGRIFT, M.A., Assistant in History.

DAVID BJORK, M.A., Teaching Fellow in History.

UBALDO J. MARRA, M.A., Teaching Fellow in History.

LAWRENCE HILL, A.B., Teaching Fellow in History.

N. F. BAKER, M.A., Teaching Fellow in History.

RAY C. BRIDGMAN, A.B., Teaching Fellow in History.

INFORMATION FOR LOWER DIVISION STUDENTS

Introductory Courses.—Courses 4 and 8 are especially designed for freshmen, but may be taken by sophomores. Course 17 is designed for sophomores and is not open to freshmen. One lower division year-course is prerequisite for a major in the department. Sophomores who wish to enter upper division courses should consult with the instructors in charge. Students who enter the University of California as juniors or seniors may offer substitutes for History 4A–4B, History 8A–8B, or History 17A-17B. No freshman may take both History 4A–4B and History 8A–8B at the same time.

Foreign Languages in the Lower Division.—All students who intend to take upper division courses in history are advised to acquire a reading knowledge of at least one of the following languages before they reach their junior year: French, German, Italian, Latin, Spanish.

---

[1] In residence first half-year only; [2], second half-year only.

* Absent on leave, 1920–21.

Digitized by Google

Information for Upper Division Students

Classification of Upper Division Courses.—It will be seen on consulting the list of courses below that, in the upper division, the first course in each field of history ordinarily is a general survey (cf. courses 111, 121, 141, 151, 161, 162, 165, 171, 181). These general courses are followed by corresponding advanced courses in which some part of the larger field is studied intensively (cf. courses 112, 122, 142–145, 152–155, 166, 172–174B, 182–189). No student will be restricted in the choice of upper division courses, but the department is ready to give advice in this matter, especially to students who are looking forward to a higher degree or to a teacher's recommendation with history as a major subject. The department recommends that at least one general (or 3-hour) course be followed by a corresponding advanced (or 2-hour) course.

Honors-Students in the Upper Division.—Honors will be conferred only upon students who have completed, with distinction, at least 30 units of history (including course 199), of which at least 18 units must be upper division work.

For information concerning graduate work and the Teacher's Recommendation in the Department of History see the Announcement of the Graduate Division published April, 1920.

Lower Division Courses

4A–4B. History of Modern Europe. (3–3) Yr. ——
Lecture, M W, 10, and a section hour to be arranged.

The growth of western European civilization from about 1500 A.D. to the present time. An introduction to the study of history, affording a general perspective of the development of society, politics, and institutions in Europe. No textbook is used, but a syllabus of sixty lectures is provided, thirty to be delivered each term. The first half-year's work extends to the latter part of the eighteenth century and the second half-year's work from that date to the present time. The class is divided into sections in which recitations are conducted by the assistants, one section meeting per week being arranged for each student. Conferences with individual students are held in Room 131, Library. Designed especially for freshmen, but open to sophomores. Advanced students are eligible only by permission of the instructor. Course 4B is open to students who enter at the beginning of the second half-year. Syllabus fee, $1.50 per year.

8A–8B. History of the Americas. (3–3) Yr. Bolton
Lectures, Tu Th, 11, and a section hour to be arranged.

A general survey of the history of North America, South America, and Central America, from the discovery to the present time. Emphasis is placed on the planting of European civilization in the Americas, the growth of the colonies of the different nations, the international contest for the continents, the wars of independence in English-America and in Hispanic-America, the development of the independent American republics, their relations with each other and with the rest of the world. No text book is used, but a syllabus of the sixty lectures is provided. The class is divided into sections in which

Digitized by Google

recitations are conducted by the assistants, one section meeting per week being arranged for each student. Conferences for individual students are held in Room 131, Library. Designed especially for freshmen, but open to sophomores. Advanced students are eligible only by permission of the instructor. Course 8B is open to students who enter at the beginning of the second half-year. Syllabus fee, $1.50 per year.

17A–17B. History of the United States. (3–3) Yr. McCormac
Prerequisite: sophomore standing. Book fee, $1.50 per year.

Settlement and the development of institutions in the thirteen English colonies; political, social and economic history of the United States. Frequent written recitations on the lectures and assigned reading.

Upper Division Courses*

*107. Naval History. Leebrick

A survey of the history of sea power and its relation to the development of civilization. Special attention is given to the navy of the United States: its history, traditions and organization. The course attempts to give an appreciation of the problems and importance of sea power.

111A–111B. Ancient History. (3–3) Yr. Van Nostrand

(A) Greek history to the Roman conquest. (B) Roman history to the sixth century A.D.

Prerequisite: a reading knowledge of French, or German, or Italian.

112A–112B. Roman Imperialism. (2–2) Yr. Van Nostrand
Prerequisite: a reading knowledge of French or German or Italian or Latin.

The effect of expansion upon the institutions of Rome. Success and failure of Rome as an imperial state.

121A–121B. Medieval History. (3–3) Yr. Paetow
Prerequisite: a reading knowledge of one of the following languages: French, German, Italian, Spanish, Latin.

A general survey of European history from about 500 to about 1500, based on Paetow, *Guide to the Study of Medieval History*, pt. II.

122A–122B. Medieval Culture. (2–2) Yr. Paetow
Prerequisite: a reading knowledge of French or German.

From about 500 to about 1300, with special emphasis on the twelfth and thirteenth centuries, based on Paetow, *Guide to the Study of Medieval History*, pt. III.

*123A–123B. Medieval France. (2–2) Yr. Paetow
Prerequisite: a reading knowledge of French.

From the Treaty of Verdun to Louis XI. A general survey of political and social history. Considerable emphasis is laid on the history of institutions: (A) Feudal institutions; (B) Monarchial institutions.

---

* Not to be given, 1920–21.

Digitized by Google

*131A–131B. Renaissance and Reformation. (3–3) Yr. ——

NOTE.—In courses 141A–141B, 145A–145B, 165A–165B, 166A–166B, a knowledge of a modern foreign language is desirable.

141A–141B. Modern European History. (3–3) Yr. LEEBRICK

Prerequisite: one of the lower division courses in history.

A study of the general history of Europe from about 1648 to 1914, based in part on Stephens, *Syllabus of a Course of Lectures on European History.*

*142A–142B. The French Revolutionary Period in Europe. (2–2) Yr. ——

*143A–143B. The Napoleonic Period in Europe. (2–2) Yr. ——

145A–145B. History of Europe in the Nineteenth Century. (2–2) Yr. LEEBRICK

A study of the various developments in European history in the last century with special emphasis on the Metternichian and Bismarckian systems.

*147A–147B. Diplomatic History of Europe since 1815. ——

A general survey with the emphasis on international relations.

*151A–151B. History of England. (3–3) Yr. ——

Lectures on the political and constitutional history of England with the study of documents contained in Adams and Stephens, *Selected Documents of English Constitutional History.*

*152A–152B. Constitutional History of England. MORRIS

Prerequisite: course 151A–151B (may be waived by the instructor).

A detailed study on the origin and growth of the English Constitution. Especially designed for students of law.

*155A–155B. History of the British Empire. MORRIS

History of English colonies and dependencies.

†161A–161B. History of Spain and Portugal. (3–3) Yr. CHAPMAN

The European background of Hispanic America, with special emphasis on institutions. (A) To 1516. (B) To date.

A reading knowledge of Spanish, Portuguese, or French is desirable. Not open to students who have credit for course 161A.

*162A–162B. History of Hispanic America from 1808. CHAPMAN

The wars of independence and the development of Hispanic American states, with emphasis on their relations with the United States. Special attention is given to conditions of life in South America at the present time.

A reading knowledge of Spanish, Portuguese, or French is desirable.

---

* Not to be given, 1920–21.

† Not to be given August-December, 1920.

Digitized by Google

163A. The Intellectual History of the Spanish American Republics. (2) I. RAMÍREZ

A general survey of the development of education, art, and literature since the period of Independence, with an intensive examination of the modernist movement in belles lettres.

164A. History of South America. (3) I. RAMÍREZ

The ethnological background; transmission of Spanish culture; geographical, economic, and social factors in the development of the modern states; South American influences on the programme of Pan-Americanism; modern problems and tendencies.

165A–165B. History of Hispanic America to 1810. (3–3) Yr. PRIESTLEY

The discovery and occupation of Hispanic America; colonial policies of Spain and Portugal; development of their colonial political, economic, and social institutions, and a comparison of these with the institutional phases of other European expansios.

166A–166B. History of Mexico. (2–2) Yr. PRIESTLEY

The colonial background; the establishment of independence and the struggle for constitutional government. In the second half-year the emphasis will be upon modern trade conditions and diplomatic relations with the United States.

*171A–171B. History of the United States. (3–3) Yr. MCCORMAC

A general course dealing with the English colonies and the political history of the United States.

172A–172B. Constitutional History of the United States. (2–2) Yr. MCCORMAC

Prerequisite: course 171A–171B (may be waived by the instructor). Colonial governments; formation of the national constitution; historical development of constitutional government in the United States.

*173A–173B. The Civil War and Reconstruction. (2–2) Yr. MCCORMAC

*174B. History of the United States since 1868. (2) II. MCCORMAC

181A–181B. The History of the West. (3–3) Yr. BOLTON

The settlement and development of the West, and its influence upon national and international affairs at each stage of advance. The emphasis will be upon the Trans-Mississippi West.

*182A–182B. Spain in North America. (2–2) Yr. BOLTON

Prerequisite: course 161A–161B, or 181A–181B. A reading knowledge of Spanish is desirable.

A general survey of the establishment of Spanish rule and Spanish institutions of North America, followed by a more detailed study of Spanish activities in and relative to territory now within the United States.

* Not to be given, 1920–21.

Digitized by Google

†189A–189B. History of California. (2–2) Yr. CHAPMAN

The discovery and settlement by the Spaniards, the coming of the Americans, and the development of the American state.

199A–199B. Honors Course. Members of the Department

TEACHERS' COURSE

301. The Teaching of History. (3) Either half-year. VAN NOSTRAND

A discussion of the teaching of history in secondary schools, with special reports and criticism of textbooks.

GRADUATE COURSES

202A–202B. Historical Method and Bibliography. (2–2) Yr. PAETOW

The work in the course is based primarily on Langlois and Seignobos, *Introduction to the Study of History.* The second half-year is devoted largely to practical exercises.

211A–211B. Ancient History. (2–2) Yr. VAN NOSTRAND

The subject for 1920–21 will be: The Roman public land system.

221A–221B. Medieval History. (2–2) Yr. PAETOW

*222A–222B. Introduction to Latin Palaeography and Diplomatics. (2–2) Yr. PAETOW

The practical exercises in this course will be done mainly with facsimiles of manuscripts of the twelfth and thirteenth centuries.

241A–241B. Modern European History. (2–2) Yr. LEEBRICK

The Metternichian period in Europe.

*251A–251B. Studies in Early English Institutions. MORRIS

†261A–261B. History of Spain and Portugal. (2–2) Yr. CHAPMAN

†262A–262B. The History of Chile. (2–2) Yr. CHAPMAN

*265A–265B. History of Hispanic America to 1810. (2–2) Yr. PRIESTLEY

266A–266B. History of Mexico. (2–2) Yr. PRIESTLEY

For 1920–21 the subject will be: Economic Development of Mexico, 1821–1910.

271A–271B. History of the United States. (2–2) Yr. MCCORMAC

For 1920–21 the subject will be: The Civil War.

281A–281B. Spain in North America. (2–2) Yr. BOLTON

282A–282B. The Trans-Mississippi West. (2–2) Yr. BOLTON

*289A–289B. History of California. (2–2) Yr. CHAPMAN

299. Thesis for the Master's Degree.

† Not to be given August-December, 1920.

* Not to be given, 1920–21.

Digitized by Google

HOME ECONOMICS

Two distinct courses of study are offered in the general field of home economics, one in household art and the other in household science. These two courses may be combined by the individual student with the consent of these departments. Such a combination is often impracticable, however, on account of the prerequisite drawing and design on the one hand and the more advanced prerequisite chemistry on the other. Students who wish to enter upon either of these courses of study or upon a combination of the two are urged to include in their work for matriculation elementary chemistry, botany, geometrical and freehand drawing, clothing and foods as listed in the Circular of Information, under general list of preparatory subjects. Such a plan will enable students to fulfill without delay the requirements for the junior certificate and to secure fundamental training in the subjects preparatory for the major work in Household Art or Household Science.

For description of courses students are referred to the Department of Household Art and the Department of Household Science.

Digitized by Google

HOUSEHOLD ART

MARY F. PATTERSON, Associate Professor of Household Art and Design.
ANNE SWAINSON, M.A., Associate in Textiles.
HELEN W. FANCHER, Associate in Household Art.
MAE LENT, Associate in Household Art.

JOHN W. GILMORE, M.S., Professor of Agronomy.

Equipment.—Adequate laboratory equipment is provided for the courses in clothing construction and design, textile analysis and weaving, interior decoration and other courses in original design in material. Photographs, lantern slides and other illustrative materials are provided for the lectures on the historical and artistic background necessary for these courses. A number of carefully selected books on art subjects have recently been added to the library for the advanced work in historical research.

Admission and Prerequisites.—Students who intend to offer major work in household art should have completed matriculation botany, chemistry, clothing and mechanical drawing. A student's progress is often delayed by the omission of this matriculation work. Opportunity is, however, offered in the Summer Session to make up these subjects.

PREPARATION FOR THE MAJOR

Required: Household Art 1A–1B (6); History 4A–4B or 8A–8B (6); Graphic Art 6A–6B (6); Physics 2A–2B (6); Chemistry 1A–1B (10); Economics 1A–1B (8); or the equivalents.

Recommended: Graphic Art 12 (2); Graphic Art 14 (2); Psychology 2A (3); French, Italian, or German.

NOTE.—If mechanical drawing, freehand drawing and botany are not offered for matriculation, Drawing C (2), Graphic Art AB (2), Botany 2A (4) should be added, in the summer session if possible.

If specialization in interior decoration is to be pursued, Drawing 3ABC (6); Architecture 5A-F (6); 11 (3), 12A–12B (2), 13A–13B (2), 14A-14B (2) should be added.

Sequence of Courses for Major Work.—A major in household art consists of approximately twenty-four units of upper division work chosen from four distinct groups of upper division courses leading to professional work in different fields of household art study—the teachers' training course; costume design, illustration and stage settings; the training for interior decoration; the specialization for occupational therapy.

I. Training for the High School Teacher's Recommendation. Candidates are required to complete the major work in household art as stated in the bulletin of the School of Education for 1920–21. The bachelor's degree with this major should be followed in the fifth year by the Teachers' Course 300 and the required work in education, together with a minimum of eighty hours of supervised practice teaching taken in connection with Education 320. Further graduate study should be chosen

Digitized by Google

from Household Art 294A–294B, *295A–295B, 297 or *298. Students offering this programme should add another semester of work if at the same time they are candidates for the master's degree.

II. Specialization in Costume Design. This group should include the lower division prerequisites for major work as stated under Admissions and Prerequisites. Advanced work should include Household Art 193A-193B, 194A–194B, 197A–197B, 198; Graphic Art 127 and 128A–128B. Courses recommended: Household Art 177A–177B, *180; Economics 182; Household Art 194A–194B; and French, German, or Italian. Graduate courses: Household Art 294A–294B and 299.

III. Specialization in Interior Decoration. This group should include lower division prerequisites for major work, with the addition of work in drawing and architecture as stated above. Advanced work should include Household Art 195A–195B, 198, 198C, 160; Architecture 110; Civil Engineering 125; Economics 182; and a choice should be made of four units from Household Art *176, 177A or 177B, *178 or *180. Courses recommended: Landscape Gardening 101 and 103; Household Art 194A-194B. Graduate courses: Household Art 295A–295B and 299.

IV. Specialization in Occupational Therapy. This group should add to the lower division prerequisites for major work as stated above Psychology 2A, which is required for Psychology 102B, and advanced work should include Household Art 193A–193B, 194A–194B, 197A–197B, 198, *176; Psychology 102B. Graduate courses: 294A–294B or *295A–295B; *298 and 299.

Honors-Students in the Upper Division.—Requirements for candidacy for honors in household art at graduation are as follows: (1) The creditable completion of 24 units of upper division work approved by the department. (2) The continuance of the honors-status, and the privileges and opportunities offered to candidates thereby, depends upon the ability of the student to do original and independent work and upon the maintenance of a high standard in all courses as well as in the special honors work undertaken.

A reading knowledge of French, Italian, or German is most desirable. The field of study may include all types of decorative and applied art, the materials used, and their past and present mode of manufacture, whether by hand or machine processes. Such research is admirable as a basis for graduate work leading toward a master's degree.

Master's Degree.—The requirements are stated in the Announcement of the Graduate Division.

Summer Session.—The courses offered in the summer session are intended to meet the requirements of visiting teachers, and of university students who wish to take courses which may not have been scheduled in the fall or spring sessions. Textile work, courses in the theory and application of design to costume and interior decoration, sewing and methods courses for teachers are frequently offered. Graduate courses in artistic and historic research in household art subjects may also be included in the summer programme, when so announced.

Extension Service.—Co-operation with the University Extension Division is offered whenever possible by the outlining of courses to be given under its auspices for the outside public. Textile tests for adulteration of fabrics are frequently made for housewives and other interested persons. Bibliographies are also sent out on request.

---

* Not to be given, 1920–21.

Digitized by Google

Laboratory Fees.—Household Art 1A–1B, $2.50; 193A–193B, $4; 194A-194B, $1.50; 195A–195B, $1.50; 198 (I), $3; 198C (II), $3; 197A–197B, $2; *176 (I), $3; 177A–177B, $3; *178 (II), $3. These fees are payable each half-year and cover only photographic blueprints, the use of microscopes and other special equipment, materials and supplies for analysis and construction problems. Materials for individual problems are to be furnished by the students.

Lower Division Course

1A–1B. Clothing. (3–3) Yr. Patterson, Fancher, Lent

Lectures illustrated with stereopticon, Th, 1; laboratory: Sec. 1, M W, 1–4; Sec. 2, Tu, 1–4, Th, 2–5; Sec. 3, F, 1–4, S, 9–12.

Prerequisite: matriculation clothing. Laboratory fee, $2.50.

Lectures on artistic appreciation through design; a study of pattern and color in materials of past and present day manufacture; the evolution of typical forms in clothing and household articles; the simplification or standardization of dress individualized by color and decorative features; uniforms and their place in modern dress; a brief survey of laces of historic character and those in common use; analysis of modern dress from the standpoints of hygiene, economics, and design. A notebook is required.

Upper Division Courses

193A–193B. The History of Costume. (3–3) Yr. Patterson

M W F, 10. Prerequisite: History 4A–4B or the equivalent.

Costume as pictured in the art of all ages, with a background of contemporary historical periods. Lectures illustrated with stereopticon. Students will be required to make a style-book and a fee of $4 each half-year will be charged for the photographs so used.

194A–194B. The History of Costume Laboratory: Advanced Design. (2–2) Yr. W F, 1–4.

Prerequisite: Graphic Art 6A–6B and 12. Household Art 193A–193B should be taken concurrently, also Graphic Art 127 and 128A–128B. Laboratory fee, $1.50.

The application of the principles of design and color to advanced problems including costume and related work, with renderings in several mediums. Experimentation in materials with dyes and dye resists.

*195A–195B. House Furnishing. (3–3) Yr. Patterson

Lecture, Tu, 8, illustrated by stereopticon; laboratory: Tu Th, 9–12. Prerequisite: Mechanical Drawing, Graphic Art 6A–6B. Recommended: Graphic Art 12. Civil Engineering 125 should precede or parallel this. Laboratory fee, $1.50.

The work of the first semester covers a study of the modern house—its site, plan, space relations and proportions, built-in equipment, hardware, finishes for walls, woodwork, floors; color and textures in furnishing under varying conditions of light and use; design, selection and placing of furniture, textiles and decorative objects.

The work of the second semester includes the history of furniture, a study of "Period Styles"—their origin, development and in-

* Not to be given, 1920–21.

Digitized by Google

fluence on modern interior decoration, and their suitable application to its problems. Laboratory work includes library research and analysis in connection with such study; original designs for modern furnishing with experimentation in color processes and combinations of textures in material.

198. Textiles. (4) I. GILMORE, SWAINSON
Lectures, Tu Th, 8; laboratory: Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4. Prerequisite: matriculation botany or Botany 2A and Chemistry 1A–1B. Laboratory fee, $3.

A study of textile raw materials; analysis of the physical and chemical characteristics of fibres in commercial use and their preparation for use on filatures, cordage and woven fabrics; ancient and modern processes of manufacture—spinning, weaving, finishing; tests for adulteration and durability; studies in purchasing.

198C. Textiles. (3) II. SWAINSON
Lecture, Tu, 1; laboratory, Tu, 2–5, Th, 1–4. Prerequisites: course 198 and Graphic Art 6A–6B and 12.

Historical study of textile weaves from primitive time to the present day. A notebook is required for library and pattern research. Laboratory work includes analysis of certain distinctive historic weaves, with experimentation in warping and weaving. Original designs are executed for modern household purposes with special consideration of color, texture and beautiful proportion.

197A–197B. Review and Discussion of Technique by Practical Problems. (2–2) Yr. Tu Th, 9–12. FANCHER
Prerequisite: course 1A–1B, Graphic Art 6A–6B or equivalents and course 198, which may precede or parallel this. Laboratory fee, $2.

This course is intended for students who are preparing either to teach clothing or to enter other lines of artistic professional work. A notebook is required.

160. House Management. (2) II. ——
Lectures and discussion, M W, 11; laboratory, discussion and field work, Tu Th, 2–4, S, 10–12. Prerequisite: Economics 1A–1B. Laboratory fee, $1.

Household Art 198 should precede this in sequence or be taken concurrently. Organization of the work of the household from the standpoint of efficiency, service, convenience; consideration of equipment and of a variety of systems for heat, light, ventilation, water; demonstration of labor saving devices and improvement of method in common household tasks; household finances—budgeting, recording, buying. Visits will be made to institutions and manufacturing plants.

*176. Basketry. (2) I. Tu Th, 9–12. SWAINSON
Prerequisite: Graphic Art 6A–6B and 12. Laboratory fee, $3.

The earliest form of textile industry among primitive peoples; their materials, constructions, design, purposes. Original designs are made and carried out in terms of these basketry materials. A notebook is required for library and pattern research. This course is intended for advanced students wishing to teach design principles through work in material.

* Not to be given, 1920–21.

Digitized by Google

177A–177B. Metal-work and Jewelry. (2–2) Yr. SWAINSON
W, 1–4, S, 8–11. Prerequisite: Graphic Art 6A–6B and 12 or equivalents. Laboratory fee, $3. Recommended: as a parallel course 193A-193B.

A study of the principles of design in historic metalry; ornamentation growing out of construction and exemplified by the execution of original designs for modern uses in metal and inexpensive stones. Notebook required.

*178. Pottery. (2) II. Tu Th, 9–12. SWAINSON
Prerequisite: Architecture 14A–14B and Graphic Art 6A–6B and 12. Laboratory fee, $3.

*180. Dyes and Dyeing. (3–3) Yr.
Lectures and laboratory.

199. Honors Course. (1 or 2) Either half-year. PATTERSON
Special reading will be assigned individually, according to the interest and preference of the student, and frequent conferences with the instructor will be arranged. Credit not to exceed 2 units either half-year will be determined in advance for each student.

300. Teachers' Course. (2) I. M W, 9. The STAFF
Prerequisite: senior or graduate standing, with a major in household art.

Lectures and discussion of methods of presentation of household art subjects for secondary schools and extension classes, with consideration of suitable equipment, the use of illustrative material and the formulation of lesson plans for these fields of study; the consideration of work in household art which may come under the head of "related subjects" in connection with vocational training.

The Practice of Teaching. The STAFF
I or II or throughout the year. Prerequisite or parallel: course 300.

Opportunity for practice teaching under the direction of members of the staff will be available either half-year or throughout the year in connection with Education 320.

305. Teachers' Course in Industrial Art for the Elementary Grades.
(2) II. W, 4–6. SWAINSON
Lectures with laboratory application.
This course includes a study of materials, industrial processes and related subject matter organized in terms of the elementary school child. It is designed particularly for teachers and supervisors of the elementary schools and vocational part-time courses.

294A–294B. Seminar in Costume Design. (3–3) Yr. PATTERSON
Tu Th, 9–12.

Original designs for modern costume. Historic research in "Period Styles" for stage settings and costumes. Drawings, renderings in water color and other mediums. This should be preceded by 193A-193B, 194A–194B, 197A–197B, and Graphic Art 128. (Outside reading required.)

* Not to be given, 1920–21.

Digitized by Google

*295A–295B. Interior Decoration. (3–3) Yr. M W, 9–12. The STAFF

297. Advanced Study. (2). PATTERSON

Intensive study may be undertaken in some special phase of design or household art in connection with teaching. Such work may satisfy the requirement for graduate study for the High School Teacher's Recommendation.

*298. Occupational Therapy. The STAFF

299. Thesis for the Master's Degree. The STAFF

ALLIED COURSES WHICH MAY BE TAKEN AS MAJOR WORK IN HOUSEHOLD ART

Graphic Art 127, 128. (Art Anatomy.) NAHL

Architecture 110. (Housing.) HAYS

Economics 182. (Studies in the Standards of Living.) PEIXOTTO

Civil Engineering 125. (Plumbing, Heating, Ventilating and Lighting.) LANGELIER

* Not to be given, 1920–21.

Digitized by Google

HOUSEHOLD SCIENCE

AGNES FAY MORGAN, Ph.D., Associate Professor of Household Science.
RUTH OKEY, Ph.D., Assistant Professor of Household Science.
—— ——, Instructor in Household Science.
ANITA M. LASSEN, A.B., Assistant in Household Science.

Equipment.—Complete laboratory equipment is provided for, (*a*) practical cooking manipulations in large and small quantity, (*b*) chemical food analysis and calorimetry, (*c*) metabolism and animal feeding experiments. Technical control of food products, such as the official bread-baking tests, milk examination, etc., is included along with the quantitative chemical analysis of food. Modern urine and blood analysis methods, respiratory exchange, and metabolism balance experiments form the major part of the dietetics laboratory practice, but preparation and measurement of calculated diets based on these findings are also emphasized.

Admission and Prerequisites.—Students who intend to make household science their major subject must present matriculation chemistry and cooking. Both of these courses are offered during the summer session, the latter as Household Science AB. Matriculation physics and biology or physiology are strongly recommended as part of the preparation for admission to the department.

PREPARATION FOR THE MAJOR

Required: Chemistry 1A–1B (10 units), 8 (3), 5 (3); Bacteriology 1 (4).
Recommended: Physiology 1 (4); Economics 1A–1B (8); Physics 2A–2B (6); Chemistry 9 (3).

Sequence of Courses.—Three types of course sequences leading to different professions are distinguished: the teachers' training course; the hospital dietitians' course; the research or laboratory workers' course. All of these courses are identical so far as undergraduate major work in the department is concerned, but differ in the choice of courses during the graduate year and in collateral undergraduate courses.

1. The *teachers' training course* may in the fifth year be developed in either of two directions, (*a*) toward preparation for high school teaching and supervision, or (*b*) toward vocational or extension teaching. The bachelor's degree with a major in household science is necessary as prerequisite for the graduate work for either of these types of teacher training. For further information see the Announcement of the School of Education.

2. *The hospital dietitian's graduate year* follows the usual undergraduate major in household science, and requires residence at the University of California Hospital in San Francisco. The course is offered in cooperation with the University of California Medical School and hospitals, and is designed to furnish the practical as well as the theoretical training for the profession of hospital dietitian.

Digitized by Google

The undergraduate sequence recommended as preparation for this work is as follows: 101A–101B, 120A–120B, 130, 106, Biochemistry 101 (full course), Public Health Nursing, Economics 180, 182. For detailed description of the course see the Announcement of the Graduate Division.

3. *The Research or Laboratory Worker's Course* follows the undergraduate sequence, 101A–101B, 120A–120B, 106, Bacteriology 1, Biochemistry 101, Chemistry 110. Courses 125, 130, 216 and four or more units of 214 are advised for the fifth year. Problems in experimental cookery, animal feeding, human digestion or metabolism, may be undertaken as the basis for the master's thesis.

Master's Degree.—The requirements are stated in the Announcement of the Graduate Division.

Honors-Students in the Upper Division.—Students who are eligible for the honors status are urged to enroll at the beginning of their third or junior year. The recommended sequence of courses for such students is as follows: third year, course 101A–101B, Biochemistry 101; fourth year, 120A–120B, 125 or 130. Honors at graduation are awarded only on the completion of 24 units of upper division work, and maintenance of the honors status is dependent upon the attainment of consistently satisfactory grades in other subjects and of high credit in household science courses.

Summer Session.—Course AB, equivalent to the high school course in domestic science, is offered each summer. In addition, course S2, an elementary treatment of dietetics, is usually offered for nurses, housekeepers, and students who desire a brief and practical survey of this field. An advanced or seminar course and the opportunity to prosecute research are usually available also during the summer session.

Extension Service.—Through the University Extension Division a correspondence course in child feeding is now offered by the staff of the department, and further courses are in preparation. Credit toward the degree is not allowed for these or similar courses offered by other institutions.

Upper Division Courses

101A–101B. Food Economics. (4–4) Yr. ——

Lectures, Tu Th, 9; laboratory, Tu Th, 1–4. Deposit, $10. Prerequisite: Chemistry 8, 5, Bacteriology 1, and the high school course in domestic science.

The composition, production, transportation, and preservation of common foods with reference to public economy and conservation; individual selection and preparation of such food with reference to hygiene, nutritive value, flavor, and cost; an introduction to quantitative methods in food analysis.

102. Food and Dietetics. (4) II. Okey

Lectures, M W F, 1; laboratory, M W F, 2–4. Fee, $5. Prerequisite: Chemistry 1A–1B and at least junior standing.

Designed to meet the needs of students planning to take nurses' training. A brief survey of food economics, including food preparation, and the field of normal and abnormal nutrition; practice in the making of dietaries; calculation and preparation of special diets, and milk formulas.

Digitized by Google

106. Laboratory Methods in Metabolism. (5) I. OKEY
Lectures and laboratory, M W F, 1–5, and a conference hour to be arranged. Deposit, $12. Prerequisite: Biochemistry 101.

Modern methods of chemical diagnosis, including practice in qualitative and quantitative examination of gastric contents, urine, blood, milk, feces, etc. The course is designed for public health workers, laboratory technicians, and those preparing to do research in human nutrition.

110. Institution Management. (3) I. ——
Lectures, Tu Th, 10; field work, S, 9–12. Prerequisite: courses 120A–120B.

The principles and practices involved in the organization and administration of institution households, hotels, restaurants, hospitals and community feeding enterprises.

112. Extension Organization. (3) II. ——
F, 1, and two three-hour practice periods to be arranged.

The methods and materials involved in the organization and presentation of such scientific and economic facts and theories as may be helpful to the home-maker. Consideration of the problems of the teaching of vocational home-making under the provisions of the Smith-Hughes Act. Two periods per week of three hours each are devoted to supervised demonstrations, lectures, continuation classes, arrangement of exhibits, and other forms of extension activity. Open to seniors or graduates in household science.

120A–120B. Dietetics. (4–4) Yr. MORGAN
Lectures, Tu Th, 11; laboratory, M W, 9–12. Deposit, $10. Prerequisite: Biochemistry 101 (5 units), Chemistry 5.

The quantitative basis of dietetics established through typical experiments in food analysis and calorimetry, digestion experiments, respiration and dietary records, nitrogen and mineral balances; the application of these principles to practical feeding problems of the individual and the group.

125. Quantitative Experimental Cookery. (3) I. M W F, 1–4. ——
Fee, $5. Prerequisite: course 101A–101B.

Practice in food preparation under controlled conditions; quantitative analysis of the materials and products. This course is preparatory to research in food and nutrition.

300. Methods of Teaching Household Science. (2) I. M W, 8. ——
Prerequisite: course 120A–120B and at least 3 units of education.

Study of suitable equipment for teaching household science in elementary and secondary schools; planning of courses, and of single lessons; observation of classes; practice in demonstrations of food preparation and classification.

127. The Technique of Food Preparation. (3) II. ——
Tu Th S, 8–11. Fee, $5.

A critical and constructive review of technique for students planning to teach food study in the secondary schools. Open only to candidates for the teacher's recommendation offering a major or minor in household science.

Digitized by Google

*130. The Nutrition of Development. (3) II. MORGAN
Lectures, Tu Th, 9; laboratory, F, 9–12. Prerequisite: course 120A, or Biochemistry 101.

The chemistry and physiology of intra-uterine development, lactation, and growth; normal and subnormal nutrition in infancy and childhood; practice in the solution of feeding problems; clinic and follow-up work are included.

GRADUATE COURSES

The Practice of Teaching Household Science.
Prerequisite or parallel: course 300.

Opportunity for practice teaching under direction will be available either half-year in connection with Education 320.

214. Research. The STAFF

The principles and methods of physical and biological chemistry applied to the investigation of problems concerned with food preparation and metabolism.

215. Special Studies. Either half-year. Alt. Th, 7-9. The STAFF

216. Seminar in Normal Metabolism. (2) I. MORGAN and OKEY
F, 9–11.

Recent advances in the chemistry of food and nutrition, metabolism, food economics, and dietetic therapy.

219. Seminar in Disorders of Nutrition. (2) II. F, 9–11. OKEY

299. Thesis for the Master's Degree.

* Not to be given, 1920–21.

Digitized by Google

HYGIENE

ROBERT T. LEGGE, Ph.G., M.D., F.A.C.S., Professor of Hygiene and University Physician.

JOHN N. FORCE, M.D., M.S., Gr.P.H., Associate Professor of Epidemiology.

RUBY L. CUNNINGHAM, M.D., M.S., Assistant Professor of Hygiene and Physician for Women.

LAURA CAIRNS, M.S., Associate in Hygiene.

MARGARET BEATTIE, M.A., Associate in Public Health.

CHARLES L. MCVEY, M.D., Senior Physician for Men.

LUTHER M. BOYERS, A.B., M.D., Assistant Physician for Men.

LOUISE A. OLDENBOURG, M.D., Assistant Physician for Women.

PREPARATION FOR THE MAJOR IN PUBLIC HEALTH

Required: Chemistry 1A–1B (10 units); Bacteriology 1 (4); Zoology 1A–1B (9); Physics 2A–2B (6); French or German.

Recommended: Chemistry 8, 9; Economics 1A–1B.

Laboratory fees are $5 for courses 300, 108A and 108B; $5 additional deposit is required in each laboratory course and will be refunded, less deduction for breakage, at the end of the half-year.

Professional Course in Public Health.—The professional course in public health comprises a curriculum in sanitary engineering, hygiene, economics, veterinary science, entomology, zoology, and human nutrition, the completion of which leads to the degree of Graduate in Public Health (Gr.P.H.). For details of the curriculum the student is referred to the Circular of Information, Academic Departments.

Honors-Students in the Upper Division.—Students in the honors group may receive honors at graduation either:

1. Upon presenting a satisfactory report on a field investigation of a public health activity; or

2. Upon a thesis based on a laboratory investigation; or

3. Upon the completion of a course of reading on a special topic in public health.

Candidates for honors must prepare a programme at the beginning of their candidacy in consultation with the Committee on Public Health Study-Lists. In most cases the junior year will be spent in preliminary reading. In the senior year those students who desire to take honors on the basis of reading alone will prepare for a final oral examination; while those who desire to engage in laboratory or field investigations will prepare a thesis or report embodying their results.

The committee will recommend the exclusion from the honors group of all students who do not maintain each half-year an average of at least 60 per cent of first and second grades in all their courses and who do not complete their courses in public health with high credit.

Digitized by Google

Candidates must complete 36 units in courses chosen frcm the first two years of Curriculum A in Public Health.

Teachers' Recommendations.—For information see the Announcement of the School of Education.

Lower Division Courses

1. Military Hygiene and Sanitation. (1) I. Legge
   Sec. 1, Tu, 8; Sec. 2, Th, 1.
   Prescribed for all undergraduate men during their first year of residence. Lectures and readings.

2. Essentials of Personal and Public Hygiene. (2) I. Cunningham
   M W, 11.
   Prescribed for all undergraduate women during their first year of residence. Lectures, readings, and recitations.

3. Elementary Epidemiology. (3) I. Force, Cairns, Beattie
   M W F, 10.
   Communicable diseases now prevalent in California; their control through individual and community endeavor. General problems of food, water, insect, contact, and carrier control. Lectures, readings, recitations, and papers.

4. Domestic Hygiene. (2) I. Tu Th, 11. Cairns
   Lectures on home sanitation. For students in home economics.

5. First Aid for Women. (2) II. Oldenbourg, Cunningham, Cairns
   Sec. 1, Tu Th, 9; Sec. 2, Tu Th, 10; Sec. 3, Tu Th, 2.
   A course for women in the recognition and treatment of common accidents, with special emphasis upon conditions peculiar to children.

6. Industrial Hygiene. (2) II. M W, 11. Legge
   For engineering, commerce, and forestry students. General problems in the control of epidemic and occupational diseases. The sanitation of labor camps and factories, accident prevention, employees' welfare and compensation laws. Lectures, recitations, papers, and field surveys.

7. First Aid for Men. (1) II. Tu Th, 10. McVey
   A course for men in the recognition and emergency treatment of common accidents. Class limited to eighty.

9. Home Care of the Sick. (1) II. ——
   A course for women in general therapeutic measures of use in caring for invalids at home.

Upper Division Courses

101. Child Hygiene. (3) II. M W F, 10. Legge
   Primarily for students who intend to become teachers, but open also to students of economics. The hygiene of early child life; the cause and prevention of infant mortality; health supervision of school children and the practical sanitation of schools. Lectures, readings, recitations, papers, and field assignments.

Digitized by Google

104. Public Health Administration. (3) II. FORCE
Lectures, M W, 9; field work, S, 9–12.

Lectures, readings, individual reports and field assignments on public health administration and procedure. Open only to students who have completed one year of the curriculum in public health.

107. Advanced Epidemiology. (3) I. M W F, 9. FORCE

Lectures, readings, and individual reports on communicable diseases. Open only to students who have completed one year of the curriculum in public health.

108A–108B. Public Health Laboratory. (5–5) Yr. FORCE, BEATTIE
M Tu W Th F, 1–4. Prerequisite: Bacteriology 101.

Laboratory practice in the detection of communicable diseases.

115. Sanitary Science and Industrial Hygiene. (3) I. LEGGE
M W F, 3.

Open only to students in the curriculum in public health nursing.

116. The Control of Communicable Diseases. (3) II. M W F, 3. FORCE

Open only to students in the curriculum in public health nursing.

300. The Teaching of Hygiene. (2) I. CAIRNS and Assistants
Laboratory: Sec. 1, Tu Th, 8–11; Sec. 2, Tu Th, 1–4.

Methods of presenting the elements of hygiene and sanitation to children in graded schools.

GRADUATE COURSE

201. Research in Hygiene. FORCE

Special problems worked out in the field or in the laboratory of hygiene. Credit value to be fixed in each case.

Digitized by Google

IRRIGATION

BERNARD A. ETCHEVERRY, B.S., Professor of Irrigation Engineering.
SIDNEY T. HARDING, B.S., Associate Professor of Irrigation.

Courses 101, 102A, 102B, 103, 104, and 112 are designed to meet the needs of engineering students who wish to make a specialty of irrigation. They appear as part of the course in Irrigation Engineering in the College of Civil Engineering. Courses 101, 104, 105A, 105B, 113, and 115 are designed for students in the College of Agriculture. Courses 101, 103, 113, are also open to other students who have junior standing.

Students will be recommended for honors on the same basis as in civil engineering.

UPPER DIVISION COURSES

Junior standing is prerequisite to courses 103, 104, and 113.

101. Irrigation Institutions and Economics. (2) II HARDING
Sec. 1 (for students of engineering only), M W, 10; Sec. 2, M W, 8.
Prerequisite: course 103 or 113.

Water rights, irrigation institutions and organizations.

102A. Irrigation Engineering. (2) II. Tu Th, 11. ETCHEVERRY
Prerequisite: Civil Engineering 110 or Mechanical Engineering 103A.

Investigation and general planning of irrigation systems; conveyance of water; silt problems; design of canals, tunnels, flumes, pipelines, inverted siphons.

102B. Irrigation Engineering. (2) I. Tu Th, 9. ETCHEVERRY
Prerequisite: course 102A.

Principles of design of diversion weirs, headworks, wasteways, sand boxes, falls, checkgates, lateral headgates, road crossings, special types of distribution systems, measuring devices.

103. Agricultural Use of Water and Irrigation Practice. (2) I.
Tu Th, 11. ETCHEVERRY

Sources of water supply; disposal of irrigation water applied to the soil; water requirement of crops; duty of water; preparation of land and methods of irrigation; small pumping plants.

For engineering students, but open to other students excepting those in the College of Agriculture, for whom course 113 is offered.

104. Drainage. (2) II. Tu Th, 8. ETCHEVERRY

The structure of soils and its relation to drainage; planning of drainage systems for overflow, waterlogged and alkali lands; organization of drainage districts.

Digitized by Google

105A. Agricultural Hydraulics and Elements of Irrigation Engineering. (3) II. Tu Th, 10, and 1 hour to be arranged. ETCHEVERRY
Prerequisite: Civil Engineering 1A–1B.

Principles of hydraulics as applied to irrigation systems. The elements of irrigation projects; the conveyance of water in canals, tunnels, flumes, and pipe-lines. Open to students in the College of Agriculture. Not open to students who receive credit for course 102A.

105B. Elements of Irrigation Engineering. (2) I. Tu Th, 8. ETCHEVERRY
Prerequisite: course 105A.

Irrigation structures, their function and proportions; systems of distribution; measurement of water and measuring devices.

112. Irrigation Design. (2 or 3) I. Tu Th, 1–4. ETCHEVERRY
Prerequisite: course 102A, Civil Engineering 108A–108B.

The design of structures such as flumes, drops, inverted siphons, and headgates, with estimates of cost.

113. Agricultural Use of water and Irrigation Practice (3) I. HARDING
Sec. 1, Tu Th S, 9; Sec. 2, Tu Th S, 10; Sec. 3, Tu Th S, 11.

Soil moisture and plant growth; disposal of irrigation water applied to the soil; water requirements of crops; duty of water; preparation of land and methods of irrigation; farm ditches and structures; small pumping plants; measurement of water. For students in the College of Agriculture, but open to other students.

115. Irrigation Drawing. (2) I. Tu Th, 1–4. HARDING
Prerequisite: course 105.

Drawing and making estimates of typical irrigation structures as used on the farm. For students in the College of Agriculture.

119. Undergraduate Thesis Course. (2) Either half-year.

GRADUATE COURSES

202. Advanced Irrigation Design. (2) II. Tu Th, 1–4. ETCHEVERRY
Prerequisite: course 112. Open to specially prepared seniors.

207. Operation and Maintenance of Irrigation Systems. (2) I. HARDING
Prerequisite: courses 113 and 105 for agricultural students; courses 103 and 102 for engineering students. Open to specially prepared seniors.

208. Seminar in Irrigation. Either half-year. ETCHEVERRY, HARDING

Conferences on topics concerning the development of irrigation industry. Open to specially prepared seniors.

299. Thesis for the Master's Degree.

Digitized by Google

ITALIAN

[1]Raffaello Piccoli, Litt.D., Lecturer in Italian Literature and Institutions (to Dec. 31, 1920).

Maria Teresa Tommasini, A.B., Associate in Italian.

Preparation for the Major

Required: 13 to 16 units of lower division courses in Italian; 6 units of some other Romanic language.

Recommended: History; English; modern language.

Note.—The courses to be given by Professor Piccoli will be announced later.

Lower Division Courses

A–B. Elementary Italian. (5–5) Yr. M Tu W Th F, 8. Tommasini
Essentials of grammar. Short stories by contemporary writers.

C–D. Intermediate Italian. (3–3) Yr. M W F, 9. Tommasini
Prerequisite: course A–B.
A detailed study of syntax; dictation and memorizing of prose and verse; conversation; selection from modern texts.

Upper Division Courses

103a–103b. Modern Italian. (3–3) Yr. M W F, 10. ——
Prerequisite: course C–D, or its equivalent, or a special examination.
A detailed study of standard authors, prose and verse, with dictation and reports on assigned themes.

*105a–105b. The Fifteenth and Sixteenth Centuries.
A study of the chief writers of this period, with lectures and reports by the students.

107a–107b. Survey of Italian Literature. (2–2) Yr. Tu, Th, 11. ——
A study of the principal writers with selections from their most important works.

108a–108b. The Italian National Novel. (3–3) Yr. M W, alt. F, 11.
I, D'Annunzio, Verga. II, Deledda, Fogazzaro.

Graduate Courses

201a–201b. Dante, Petrarch, and Boccaccio. (2–2) Yr.

*205a–205b. The Civilization of Modern Italy. (2–2) Yr.

---

[1] In residence first half-year only, 1920–21.

* Not to be given, 1920–21.

Digitized by Google

JURISPRUDENCE

WILLIAM CAREY JONES, M.A., Professor of Jurisprudence and Director of the School of Jurisprudence.

ORRIN K. MCMURRAY, Ph.B., LL.B., Professor of Law.

CURTIS H. LINDLEY, LL.D., Honorary Professor of Law of Mines and Water.

ALEXANDER M. KIDD, A.B., LL.B., Professor of Law.

EDWARD ELLIOTT, Ph.D., Professor of International Law and Politics.

[2]MATTHEW C. LYNCH, J.D., Professor of Law.

AUSTIN T. WRIGHT, A.B., LL.B., Professor of Law.

MAX RADIN, LL.B., Ph.D., Professor of Law.

G. H. ROBINSON, A.B., LL.B., S.J.D., Professor of Law

WILLIAM EDWARD COLBY, LL.B., Lecturer on Law of Mines and Water.

JOHN U. CALKINS, JR., J.D., Lecturer in Law.

BARBARA N. GRIMES, J.D., Lecturer in Law and Social Economics.

M. W. DOBRZENSKY, J.D., Lecturer in Commercial Law.

ROSAMOND PARMA, J.D., Librarian of the Law Library.

SCOPE OF THE SCHOOL OF JURISPRUDENCE

The design of the School of Jurisprudence is to furnish instruction, whether historical, theoretical, or practical, in the whole orbit of law, international, public, and private. On the historical and theoretical side it offers courses in comparative law, Roman law, jurisprudence, or the theory of law, and on various topics in the history of the common law.

On the practical side, it offers a complete professional curriculum, based on either two or three years of academic training. The main body of this curriculum is of general application, constituting a preparation for the practice of law in any jurisdiction founded on the common law. At the same time, emphasis is given to courses which direct attention to local legal conditions and practice in the Western states such as mining law, water law, and code procedure. The case method of instruction is used in the professional courses.

BOALT HALL OF LAW

The School of Jurisprudence occupies the Boalt Memorial Hall of Law, a building designed exclusively for purposes of legal instruction. It was erected through the generosity of the late Mrs. Elizabeth Boalt, supplemented by subscriptions from California lawyers, as a memorial to her husband, the late John H. Boalt.

Law Library.—The law library contains a valuable collection of over twenty-five thousand volumes, and is being constantly extended and im-

[2] In residence second half-year only, 1920–21.

Digitized by Google

proved. It is conveniently placed in connection with the reading room in Boalt Hall of Law.

Law Library Fee.—A law library fee of $12.50 each half-year is charged all students, regular and special, who are registered in more than one professional course in law. All money accruing from such fees is devoted to the purchase of books for the law library of the School of Jurisprudence.

Admission to the Professional Curriculum.—The normal minimum time for the completion of the combined academic and legal curriculum is six years. This time may be somewhat diminished by the student taking extra units in the lower division, or by attending summer sessions in the undergraduate years. The School of Jurisprudence maintains a four-year curriculum and a three-year curriculum. While students are encouraged to obtain the A.B. degree before entering the School of Jurisprudence, those who have full junior standing will, for the present time, be admitted to the four-year curriculum, and those who have full senior standing will be admitted to the three-year curriculum.

Students who enter the legal curriculum with junior standing may obtain the A.B. degree on the satisfactory completion of two years of such curriculum. Such students may not anticipate in the first year of the four-year curriculum the legal courses provided for the second year thereof.

Students who enter the legal curriculum with senior standing may obtain the A.B. degree on the satisfactory completion of the first year of such curriculum.

The first year's courses of the three-year curriculum, or the first and second year's courses of the four-year curriculum, give the essential and necessary foundation for subsequent law work, and their completion is a prerequisite to entrance to the courses of the later years.

Moot Courts.—Law clubs are organized which hold moot courts with the advice and co-operation of members of the faculty. Students in the first year of the three-year curriculum and second year of the four-year curriculum are expected to prepare and argue several cases during the year. Upper class students supervise and assist in this work. Special sessions of these courts are planned so that students of the final year taking courses in Evidence and Practice may conduct the trial of cases which are specially prepared.

Preliminary University Work.—The student entering the University with the intention of pursuing the course in law is advised to map out his undergraduate curriculum with great care. He is invited to consult members of the School of Jurisprudence in respect thereto.

The intending student of law who is prepared to do so is advised to pursue a full classical curriculum. It is confidently believed that the best results will thereby be secured. If such a course is not attainable, the student is advised to take as thorough a course in Latin as possible. Such study will be profitable to him in many ways and will open up the possibility of pursuing scholarly research work in civil law and in jurisprudence in the graduate years. The attention of the law student is called to the course in elements of law Latin offered by the Department of Latin.

Every student of law should normally pursue a systematic course in history, political science and economics. He is likewise advised to make careful selection of courses in the Departments of English and Philosophy.

Digitized by Google

Whatever direction the student's pre-legal training may take, whether in history, letters, pure science, or applied science, the importance can not be too strongly impressed upon him of pursuing systematic and thorough courses in one or two departments rather than of making up a curriculum of fragmentary and unrelated subjects in a number of departments.

Further Information

For fuller information in regard to the law school, consult the annual Announcement of the School of Jurisprudence.

Academic Courses in Law

The following courses are of general cultural interest and may be elected by undergraduate students in the College of Letters and Science.

10A–10B. Elementary Law. (2–2) Yr. Tu Th, 9. Robinson
The general principles of the law. Students who intend to continue the study of law are advised to take this course in their sophomore year.

18A–18B. Commercial Law. (2–3) Yr. Dobrzensky
I, M W, 8; II, M W F, 8.
For students in the College of Commerce. Students who intend to pursue the professional curriculum are advised ordinarily not to take this course.

103A–103B. Principles of International Law. (2–2) Yr. M W, 10. Elliott
The general principles of international public law; use of standard texts, illustrative documents and cases.

105A–105B. Roman Law; Jurisprudence. (2–2) Yr. M W, 2. Radin
History of the public and private law of the Romans; systematic and historical exposition of Roman Law; with comparative views of the chief modern systems.

107A–107B. Legal History. (2–2) Yr. Tu Th, 2. McMurray
An historical survey of the principal English and American legal institutions.

109. School Legislation of California. (2) II. Tu Th, 2. Grimes
An interpretative and critical study of California school law as a resultant of social and political conditions and forces.

118A–118B. Advanced Commercial Law. (2–3) Yr. Radin
I, Tu Th, 8; II, Tu Th S, 8.
The study of cases of importance. For senior students in the College of Commerce, but open to other upper division students with the consent of the instructor.

118C. Maritime Law. (2) II. Tu Th, 9. Wright

Attention is called to the following courses having legal implications:

Elementary Roman Law [See Latin 121]. (2) I. Tu Th, 11. Merrill
The Institutes of Justinian.

Law Latin [Latin LA–LB]. (3–3) Yr. M W F, 10. Merrill

Greek Law [Greek 153]. (2) II. Tu Th, 2. Calhoun

Digitized by Google

Professional Courses

Three-Year Curriculum

Prerequisite: at least senior standing. The student must complete the curriculum of the first year before entering on that of the second and third years. All the courses in the second and third years are elective, but are distributed by years and are so arranged in the schedule of exercises. The student is advised to observe this arrangement by years, so as to secure the advantage of proper sequence of study and avoid conflict in hours of lecture.

First Year

111A–111B. The Law of Property, First course. (4–4) Yr. Robinson
I, M W, 11, F, 8; II, M W, 11, F, 10.

112A–112B. The Law of Torts. (3–2) Yr. Jones
I, Tu Th, 11, F, 10; II, Tu Th, 11.

113A–113B. Criminal Law and Procedure. (2–2) Yr. Tu Th, 9. Kidd

115A–115B. The Law of Contracts. (4–4) Yr. M W F, 9. Lynch

119. Common Law Procedure. (2) I. Tu Th, 8. Wright

120. The Law of Associations, First course (Agency). (2) II. Wright
M W, 8.

122. Equity, First course. (2) II. Tu Th, 8. Lynch

Second Year

217. The Law of Property, Second course. (3–3) Yr. McMurray
M W F, 10.

202. Constitutional Law. (2–2) Yr. Tu Th, 9. Jones

225. Law of Associations, Second course (Agency, Partnership, Corporations). (3–3) Yr. M W F, 9. Wright

227. Equity, Second Course. (*a*) Equity, (*b*) Trusts. (2–3) Yr. Lynch
I, Tu Th, 10; II, Tu Th, 10, F, 8.

230. Business Law. (2–2) Yr. Tu Th, 8. Kidd
A study of special topics in negotiable instruments, mortgages, trust deeds, banking, with a view to developing the place of these subjects in legal theory and in the modern business world.

231. Suretyship. (2) I. M W, 11. Radin

235. Damages. (2) II. Tu Th, 11. Radin

216. The Law of Mines, First course. (2) I. Tu Th, 8. Colby
A lecture course dealing primarily with the American law governing mines and mineral lands situated on the Public Domain embraced within the western states and territories.

210. The Law of Water, First course. (2) II. Tu Th, 8. Colby
A lecture course supplemented by a critical study and discussion of leading cases and mainly devoted to a consideration of the water law and rights in force in the western states.

203A–203B. Seminar in International Law. (2–2) Yr. Elliott

Digitized by Google

Third Year

221. The Law of Evidence. (2–2) Yr. Tu Th, 11. KIDD

229. Code Procedure. (2–2) Yr. M W, 8. CALKINS
Analysis and development of the fundamental notions underlying the American Reformed System of Civil Procedure.

240. Conflict of Laws. (2–2) Yr. Tu Th, 10. MCMURRAY

224. The Law of Sales. (3) I. M W F, 10. LYNCH

*226. The Law of Public Service. (2–2) Yr. ROBINSON

208. The Law of Municipal Corporations. (2) II. W, 10–12. JONES

243. Insolvency and Bankruptcy. (2) II. M W, 9. ROBINSON

218. The Law of Mines and Water, Second course. (1) COLBY

250. The Law of Persons. (2) II. Tu Th, 8. WRIGHT

209. Anglo-American Jurisprudence. (2) I. RADIN
A research course which will be devoted to a study of the definition and history of fundamental legal concepts, with particular reference to the present terminology and classification of the law.

245. Comparative Law. (2) II. RADIN
Studies in the comparative history of selected legal ideas and institutions.

244. Admiralty. (2) I. M W, 11. WRIGHT

254. Seminar in Admiralty and Maritime Law. (2) II. WRIGHT
Prerequisite: course 224.

233. Practice. (2) II. Tu Th, 2. KIDD
In connection with this course students are expected to draft the ordinary legal documents of office practice and the papers required in the different stages of action and special proceedings.

207. Seminar in Roman Law. (2) I. RADIN

260. Labor Law. (2) I. KIDD

259. Administrative Law. (2) I. M W, 9. ROBINSON

FOUR-YEAR CURRICULUM

Prerequisite: at least junior standing. Only the first and second years will be offered in 1920–21.

First Year

Prescribed Courses

115A–115B. The Law of Contracts. (4–4) Yr. M W F, 9. LYNCH

112A–112B. The Law of Torts. (3–2) Yr. JONES
I, Tu Th, 11, F, 10; II, Tu Th, 11.

* Not to be given, 1920–21.

Digitized by Google

107A–107B. Legal History. (2–2) Yr. Tu Th, 2. McMurray
May be taken in either first or second year.

119. Common Law Pleading. (2) I. Tu Th, 8. Wright

122. Equity, First course. (2) II. Tu Th, 8. Lynch

Elective

103A–103B. Principles of International Law. (2–2) Yr. Elliott
M W, 10. May be taken in either first or second year.

Second Year

Prescribed Courses

111A–111B. The Law of Property, First course. (4–4) Yr. Robinson
I, M W, 11, F, 8; II, M W, 11, F, 10.

105A–105B. Roman Law: Jurisprudence. (2–2) Yr. M W, 2. Radin
Instead of Jurisprudence 105A, students may take Latin 121: Institutes of Justinian.

120. The Law of Associations, First course (Agency). (2) II. Wright
M W, 8.

227. Equity, Second course. (*a*) Equity. (*b*) Trusts. (2–3) Yr. Lynch
I, Tu Th, 10; II, Tu Th, 10, F, 8.

Elective

113A–113B. Criminal Law and Procedure. (2–2) Yr. Tu Th, 9. Kidd

251. Quasi Contracts. (2) I. Tu Th, 11. Radin

Digitized by Google

LATIN

WILLIAM A. MERRILL, Ph.D., L.H.D., Professor of the Latin Language and Literature.

LEON J. RICHARDSON, A.B., Professor of Latin.

CLIFTON PRICE, Ph.D., Associate Professor of Latin.

HERBERT C. NUTTING, Ph.D., Associate Professor of Latin.

OLIVER M. WASHBURN, A.B., Associate Professor of Classical Archaeology.

MONROE E. DEUTSCH, Ph.D., Associate Professor of Latin.

TORSTEN PETERSSON, Ph.D., Assistant Professor of Latin.

PREPARATION FOR THE MAJOR

Required: two years of high school Latin and 12 units of Latin in the University, or three years of high school Latin and 9 units of Latin in the University, or four years of high school Latin and 6 units of Latin in the University.

Recommended: as much work as may be possible in Greek, ancient history, French, and German.

Honors-Students in the Upper Division.—Students in the honors-group whose major subject is Latin may receive honors at graduation by passing a special examination at the end of the senior year, or by maintaining a superior quality of work throughout the course. At the beginning of each half-year they should submit their study-lists for approval to the authorized representative of the department. They will then proceed with their work under the supervision of their instructors, attending conferences and making such reports of progress as may be asked for. At the close of each half-year the department will recommend the exclusion from the honors-group of students who have fallen below the standard and the promotion to the group of those whose work merits distinction.

Courses in Other Departments.—As part of the 24 units required of candidates for honors in Latin, upper division courses in the following subjects will be accepted: Greek, ancient history, Roman law, linguistics, Sanskrit, philosophy, and certain upper division courses in English or foreign languages dealing with literary types. The number and character of acceptable courses will vary with circumstances, and will be decided for each student when his proposed study-list is submitted for approval.

LOWER DIVISION COURSES

Courses C and D are intended mainly for students who enter with two or three years' preparatory Latin.

Two years of high school Latin are prerequisite to courses C, LA–LB, G.

Digitized by Google

C. Third-Year Latin: Ciceronian Prose. (3) Either half-year.
PRICE, NUTTING, DEUTSCH

I, Sec. 1 (Deutsch), M W F, 10; Sec. 2 (Nutting), M W F, 3; II, (Price), M W F, 8.

Reading of several of Cicero's orations, with attention to their historical setting. Training in understanding Latin in the Latin order, systematic study of vocabulary and review of forms. Not open to students who present Cicero at matriculation.

D. Fourth-Year Latin: Augustan Poetry. (3) Either half-year.
PRICE, NUTTING, DEUTSCH

I (Price), M W F, 10; II, Sec. 1 (Deutsch), M W F, 10; Sec. 2 (Nutting), M W F, 3. Prerequisite: three years of high school Latin or course C in the University. Not open to students who present Virgil at matriculation.

Selections from the Aeneid of Virgil; reading from Ovid may be substituted in part. The relation of the Aeneid to its time. Much attention to the reading aloud of the Latin. Study of the Virgilian hexameter, and of Virgil's style and means of expression.

LA–LB. Elements of Law Latin. (3–3) Yr. M W F, 10. MERRILL

This course is planned for future students of the law. The aim is to acquaint the student with the fundamental legal conceptions that are found in Roman law. Relatively slight emphasis is placed on the Latin, although accurate translation is insisted on. Latin L is not a substitute for Latin 1 or 5.

1. Cicero and Pliny (or the *Somnium Scipionis*). (3) Either half-year.
PRICE, PETERSSON

Prerequisite: four years of high school Latin or course D in the University.

I, Sec. 1 (Price), M W F, 9; Sec. 2 (Petersson), M W F, 10; II, (Price), M W F, 10.

The *Cato Maior* of Cicero and the Letters of Pliny, or Scipio's Dream. Study of these works as literature. Much practice in reading aloud, with attention to pronunciation, phrasing and emphasis; training in understanding Latin in the Latin order.

5. Horace's Odes and Epodes. (3) Either half-year. PRICE, NUTTING

I (Price), M W F, 8; II, Sec. 1 (Price), M W F, 9; Sec. 2 (Nutting), M W F, 10. Prerequisite: course 1.

Selections from Horace; study of the more significant poems. Attention to the metres used most frequently by the poet. Horace's literary art.

Immediately after the completion of course 5 students will be admitted to course 102, or, in case of those who complete course 5 during the first half-year, to course 106. Courses 102 and 106 must, however, be completed before the student may enter any other upper division course.

Digitized by Google

Course in Sight Translation

1B. Sight Translation, I. (1) II. Tu Th, 2. DEUTSCH
Prerequisite: two years of high school Latin. Intended especially for freshmen in any college, but may be taken by more advanced students, in either the lower or upper division, who do not pursue other courses in Latin; or without credit by advanced students in Latin.

Practice in reading at sight from easy authors, particularly Caesar.

Courses in Latin Writing

The object of the courses in Latin writing is, first, training in forms and syntax; later, in idiom, style, and periodology through imitation of classical examples; finally, in original composition.

G. Preliminary Course. (2) I. Tu Th, 10. PETERSSON
Review of forms, vocabulary, and general principles of syntax. Practice in speaking and writing Latin.

3A–3B. Latin Composition, I. (1–1) Yr. Th, 1, 2. PETERSSON
Prerequisite: three or four years of high school Latin, or course G. Exercises in writing Latin prose narrative.
See also courses 104, 112, 113, and 285.

COURSE REQUIRING NO KNOWLEDGE OF LATIN

89. Introduction to Classical Archaeology. (2) II. WASHBURN
Tu Th, 3. Prerequisite: Graphic Art 1A or junior standing.

A survey of the history of the science and of the aims and achievements of the principal workers in the field; the more important excavations and their results; the publications; the subdivisions of the subject, with an outline of the results and of the unsolved problems. Lectures illustrated by lantern slides and by books, photographs, etc.

UPPER DIVISION COURSES

Group I

The completion of courses 102 and 106 is prerequisite to admission to any of the upper division courses listed in Group II.

102. Catullus and Livy. (3) I. NUTTING, PETERSSON
Sec. 1 (Petersson), M W F, 9; Sec. 2 (Nutting), M W F, 2. Prerequisite: course 5.

The most famous of Catullus' poems and selections from Livy's Histories. Continued attention to reading Latin aloud and at sight.

106. Tacitus and Plautus. (3) II. NUTTING, PETERSSON
Sec. 1 (Petersson), M W F, 9; Sec. 2 (Nutting), M W F, 2. Prerequisite: courses 5 and 102; but students who complete course 5 during the first half-year will be permitted to take 106 before 102.

The shorter works of Tacitus (the *Agricola* or *Germania*) and one of Plautus' comedies. Attention to the methods of production of a Roman comedy and to the most common dialogue metres.

Digitized by Google

Group II

110. Horace: Satires and Epistles. (2) II. Tu Th, 8. PRICE

Lectures on Roman satire with particular reference to Horace; study of the systems of philosophy known to the Romans; rapid reading of such satires and epistles as portray the private and social life of the Augustan Age and give a clear understanding of the poet himself.

115. Roman Elegiac Poetry. (2) I. M W, 9. DEUTSCH

Reading and interpretation of the more important poems of Tibullus and Propertius; some attention will be paid to the history of the elegiac couplet; study of the style of the two poets, particularly of Propertius.

116. Ovid: Fasti. (2) I. M F, 1. RICHARDSON

In connection with the reading and interpretation of the poem, attention will be given to Roman religion and folklore, and to modern parallels.

117. Virgil: Georgics. (2) II. M F, 1. RICHARDSON

Reading and interpretation of the poem; sources of Virgil's ideas; motives and purposes of the poet; influence of the poem, both in its own age and subsequently. Special attention is given to the reading of Latin hexameter verse.

118A. Tacitus: Histories. (2) I. Tu Th, 10. NUTTING

A study of the period following the death of Nero, with some attention to the style of Tacitus and his characteristics as an historian.

119. Patristic Latin. (2) I. M W, 11. MERRILL

St. Augustine's Confessions and the Christian Hymn Writers. Although considerable attention is paid to the language, the treatment is chiefly literary and aesthetic. All the Confessions is read as a psychological study, and an essay is required from students. The hymns are illustrated by metrical translations in English. When possible the ancient melody is exhibited.

120. Martial and Juvenal. (2) II. M W, 11. MERRILL

Society under the Caesars. Two satires of Juvenal will be read privately in addition to those discussed publicly. All of the epigrams in Post's edition of Martial are read with comment on the metres and the social forces of the age. Metrical translations are read publicly, as far as they occur in English literature. The reading of Juvenal is cursory, but with attention to his attacks on the society of his time. A paper is usually required.

121. Elementary Roman Law. (2) I. Tu Th, 11. MERRILL

The Institutes of Justinian. This course may be reached either by way of course L, Elements of Law Latin, or by the regular curriculum of the Latin Department after course 106. It is intended for Latin specialists who wish to know something about Law Latin and the Roman Law, and for students in the pre-legal course who prefer to gain their knowledge of Roman Law from original sources. Special-

Digitized by Google

ists in history and philosophy may also be admitted, if qualified in the judgment of the instructor. Occasionally the course is extended through two half-years; in such event Robinson's *Selections from the Roman Law* is read in the second half-year. This course is also listed in the department of jurisprudence.

*126. Quintilian: Institutio Oratoria. (2) I. M F, 2. RICHARDSON

Education among the Romans; oratory in public and private life; the influence of Quintilian; comparison of his ideas with those of his predecessors and followers.

128. Silver and Late Latin. (2) I. Tu Th, 8. PRICE

Lectures on the principles and forces that caused the decline and breakdown of the classical language. Illustrative material is taken from Livy, Tacitus, Pliny, Seneca and post-classical authors.

139. Roman Comedy. (2) I. Tu Th, 9. PETERSSON

From five to eight plays of Plautus and Terence. Relation to the Greek drama and influence on modern comedy; dramatic performances in Rome and the place of the theatre in Roman life. The language and versification are studied only in so far as they contribute to an understanding of the plays.

140B. Latin Grammar: Syntax of the Verb. (2) I. Tu Th, 2. NUTTING

A survey of the field of verb constructions in Latin. The work is based in part upon a text; the more important questions are treated in lectures, with illustration of method in the investigation of original problems.

153. Roman Private Life. (2) II. Tu Th, 11. WASHBURN

Prerequisite: a reading knowledge of Latin; French or German will be helpful.

An account of the Roman family and its maintenance; name; marriage; children and education; slaves; clients; the house and its furnishings; daily programme; meals, the bath, the *commissatio;* burial; trades and professions. Students are expected to familiarize themselves with the contents of Johnston's *Private Life of the Romans.* Topical study by members of the class.

177. Life of Caesar. (2) II. M W, 9. DEUTSCH

Caesar's career will be studied from the sources; Suetonius' life will be read in class, while selections from other Latin authors and English translations of Greek sources will be read privately.

181. Select Titles from the Digest. (3) II. MERRILL

Books 18, 19, 20, 21, and 13.7, being part of the law of Contracts. The previous consent of the instructor must be obtained before registration in this course. It is open only to students who have done successful work in course 121. Course 181 is listed also in the department of jurisprudence.

---

* Not to be given, 1920–21.

Digitized by Google

192. Pompeii. (2) I. Tu Th, 11. WASHBURN
Prerequisite: junior standing. A reading knowledge of French, Italian, or German will be useful.

The history of the city, its destruction and excavation. The public buildings; fora, temples, theatres, baths, etc.; the houses; trades, art, inscriptions. Students will familiarize themselves with the contents of Mau, *Pompeii, its Life and Art.* Assigned readings and reports.

199A–199B. Special Study. (1–3; 1–3) Yr. The STAFF
Qualified students who desire to pursue privately some definite investigation may be permitted to do so upon approval of their application by the department. Such students will register for the course and report at intervals to the instructor in charge of their work. Credit will be determined for each student (1–3 units).

300. Teachers' Training Course. (3) II. M W F, 2. RICHARDSON
Prerequisite: senior or graduate standing.

Lectures on teaching Latin in secondary schools. Bibliography of the subject. Training in reading Latin aloud. Exercises in Latin conversation. Discussion of special points, such as the aims of the study of Latin, high school Latin curricula, college entrance requirements, correlation of Latin with other high school studies, and the like.

Courses in Latin Writing

104A–104B. Latin Composition, II (1–1) Yr. Tu, 1. NUTTING
Prerequisite: course 3A–3B. Students may be promoted into this course from course 3A–3B at midyear, in special cases.

Writing of Latin in periodic style.

112A–112B. Latin Composition, III. (1–1) Yr. Tu, 1. DEUTSCH
Prerequisite: course 104A–104B.

Translation of English selections.

113A–113B. Latin Composition, IV. (1–1) Yr. MERRILL
Prerequisite: course 112A–112B.

Original Latin essays; practice in narrative and argument. This course is taken ordinarily only by candidates for the Ph.D. degree, for whom it is prescribed. See also course 285.

GRADUATE COURSES

234A–234B. Latin Seminar. (3–3) Yr. Tu, 4; S, 10–12. MERRILL
Criticism and interpretation of the Silvae of Statius. Training in philological method and in textual criticism. The main purpose of the seminar is to fit students for independent original work in Latin philology. The members of the seminar are expected to learn all that is known about a small selection from the work of the author studied; the constitution of the text in the light of the contributions of scholars; understanding of the work as a literary product. There is much individual research, the results of which are presented to the seminar from time to time. Required of all candidates for higher degrees who make Latin their major subject.

Digitized by Google

283A–283B. Classical Archaeology. (2–2) Yr. WASHBURN

Original Roman coins of the imperial period will be the basis of the work. Required of all candidates for higher degrees who make classical archaeology their major subject.

285. Advanced Latin Composition. (1) Either half-year. NUTTING

This course treats the facts of Latin syntax from the point of view of high school teaching. Critical study of the problems of presentation; preparation of English exercises to be rendered into Latin; collection of material bearing upon the style and idiom of Cicero.

291. Cicero. (3) II. PETERSSON

Reports and discussions. Intensive study of one phase of Cicero's activity, or of a limited period of his life, or of a single oration or essay. The first two weeks will be devoted to a rapid review of Cicero's life.

299. Thesis for the Master's Degree. (2). The STAFF

Digitized by Google

LIBRARY SCIENCE

HAROLD L. LEUPP, A.B., Librarian.

SYDNEY B. MITCHELL, M.A., Associate Librarian and Head of Accessions Department.

EDITH M. COULTER, A.B., B.L.S., Reference Librarian.

NELLA J. MARTIN, A.B., Senior Assistant in the Library.

AGNES M. COLE, B.S., B.L.S., Senior Assistant in the Library.

The courses in library science are planned as a unit to give the essentials of library training. They are open only to graduates, seniors and juniors who expect to take all four courses. Graduates, and seniors whose schedules and requirements permit, may take them all in one year. Undergraduates are advised whenever possible to take courses 101 and 102 in the senior year and to include 103 and 104 in a fifth or graduate year. Juniors whose applications are accepted must complete 101 and 102 as a condition of admission to 103 and 104.

The library science courses are not open to special students. As the classes will be limited in numbers, those interested should make application in person to the Librarian before instruction begins. Before completion of the courses students will be required to demonstrate ability to use the typewriter with accuracy and a reasonable degree of speed. If possible, typewriting should be learned beforehand.

PREPARATION FOR THE MAJOR

Recommended: French and German. (A reading knowledge of both languages will be required for admission to these courses beginning 1921–22.)

UPPER DIVISION COURSES

Junior standing is prerequisite to courses 101A–101B, 102A–102B.

Senior standing is prerequisite to courses 103A–103B, 104A–104B.

101A–101B. Cataloguing and Classification. (3–3) Yr. MARTIN
M W F, 8.

The study of the card catalogue with consideration of the problems of author and title entries as illustrated by typical examples; the assignment of subject headings. Instruction given in class will be followed by actual cataloguing of books selected in illustration of different problems. The arrangement of books on the shelves, that is, their classification, will be studied with particular reference to the Dewey decimal system, but also with some attention to the Library of Congress scheme.

Digitized by Google

102A–102B. Bibliography. (3–3) Yr. M W F, 9. COULTER, MITCHELL

Dictionaries, encyclopaedias, indexes, handbooks, directories, and general works of reference, subject and trade bibliographies, periodicals and society publications, atlases and maps, United States government publications, and California state documents. Practice in the preparation of reading lists and bibliographies. Lectures, reports, and problems.

103A–103B. Library Administration and Extension. (3–3) Yr.
Tu Th S, 9. MITCHELL and Assistants

Brief outline of library history and of library development and legislation in the United States. Organization of different types of libraries. Library planning and furnishing. Library support and government; office management, care and filing of records and correspondence; library budgets and accounts; supplies; ordering of books and periodicals; accessioning. Catalogue routine. Loan department problems, charging systems, branches, stations, traveling libraries, interlibrary loans. Work with children and schools. Extension and publicity.

104A–104B. The Study and Selection of Books. (3–3) Yr.
M W F, 2. COLE and Assistants

History of printing and of books. Present-day book making and printing, style and arrangement of type, preparation of copy and correction of proof. Book paper, book illustration. Binding, materials and methods, editions, publishers. Selection of books for libraries of different types; study of guides, standard lists and current book reviewing periodicals; evaluating books and making book notes; critical examination of a selected list of new publications.

Digitized by Google

MATHEMATICS

MELLEN W. HASKELL, Ph.D., Professor of Mathematics.

GEORGE C. EDWARDS, Ph.B., Professor of Mathematics, Emeritus.

DERRICK N. LEHMER, Ph.D., Professor of Mathematics.

FLORIAN CAJORI, Ph.D., Sc.D., LL.D., Professor of the History of Mathematics.

CHARLES A. NOBLE, Ph.D., Professor of Mathematics.

THOMAS M. PUTNAM, Ph.D., Professor of Mathematics and Dean of the Undergraduate Division.

JOHN H. MCDONALD, Ph.D., Associate Professor of Mathematics.

BENJAMIN A. BERNSTEIN, Ph.D., Assistant Professor of Mathematics.

FRANK IRWIN, Ph.D., Assistant Professor of Mathematics.

*THOMAS BUCK, Ph.D., Assistant Professor of Mathematics.

PAULINE SPERRY, Ph.D., Instructor in Mathematics.

FRANK R. MORRIS, Ph.D., Instructor in Mathematics.

ARTHUR R. WILLIAMS, Ph.D., Instructor in Mathematics.

C. DONALD SHANE, Ph.D., Instructor in Mathematics.

ANNIE D. B. ANDREWS, Ph.D., Associate in Mathematics.

D. VICTOR STEED, A.B., Assistant in Mathematics.

PAUL H. DAUS, B.S., Assistant in Mathematics.

NINA M. ALDERTON, M.A., Assistant in Mathematics.

BING C. WONG, M.A., Assistant in Mathematics.

BALDWIN M. WOODS, Ph.D., Professor of Aerodynamics.

PREPARATION FOR THE MAJOR

Required: Mathematics 5 (5 units), 6 (3), 8 (3), 9 (5), A-C (6).

Recommended: Physics; Astronomy; French; Italian; German; Latin.

Honors-Students in the Upper Division.—Students who wish to become honors-students in mathematics must obtain permission from the department. They should elect courses 5, 6, 8, and 9 in the lower division. The specific courses in preparation for the final examination are 109A-109B, 111, 112, 114, and 119. Six further units are required, either in mathematics or in some related department, and approved by the Mathematics Department. But work in course 199, in which honors-students are expected to enroll throughout the senior year, may, with the approval of the department, be substituted for one or more of these courses.

Honors-students are strongly advised to elect course 104A–104B.

All candidates for honors in mathematics will be expected to pass a general examination in that subject in lieu of the examinations of the

---

* Absent on leave, 1920–21.

Digitized by Google

special courses of their final half-year. The examination will be partly written and partly oral, and will include the following subjects:

1. Geometry of the plane and of space, both analytic and projective.

2. The differential and integral calculus, including the elements of differential equations.

3. Algebra: theory of algebraic equations.

Lower Division Courses

A. Algebra. (3) I. Three sections: Tu Th S, 9, 10, 11.

Course A is substantially equivalent to the high school course in algebraic theory. Course A will not be offered after the first half-year, 1920–21, except in the Summer Session. Prospective students who expect to elect any mathematics in the university should therefore take the course in algebraic theory in the high school, since it is prerequisite to every other course in mathematics.

C. Trigonometry. (3) Either half-year.
Three sections: Tu Th S, 9, 10, 11. Prerequisite: the high school course in algebraic theory.

Course C includes the high school course in plane trigonometry.

2. Mathematical Theory of Investment. (5) Either half-year.
M Tu W Th F, 9, 2. Prerequisite: course A (or its equivalent). Prescribed in the College of Commerce.

3–4. Elements of Analysis, with Applications.

A practical two-year course in algebra, analytic geometry, the differential and integral calculus, adapted particularly to the needs of students in engineering, architecture, and chemistry.

3A–3B. Plane Analytic Geometry and Differential Calculus. (3–3) Yr.
Thirteen sections: M W F, 8, 9, 10; Tu Th S, 8. Prerequisite: courses A and C or the equivalent high school courses.

3AB. Plane Analytic Geometry and Differential Calculus. (6) II.
Daily, 10. For freshmen entering in January only.

4A–4B. Solid Analytic Geometry and Integral Calculus. (3–3) Yr.
Seven sections, M W F, 8, 10.

5. Analytic Geometry. (5) Either half-year. Irwin, Haskell
M Tu W Th F, 9. Prerequisite: course C.

The straight line, the circle, and the conic sections, including a discussion of the general equation of the second degree. Introduction to the analytic geometry of space.

6. Introduction to Projective Geometry. (3) II. M W F, 3. Steed
Required of all candidates for the teacher's recommendation with mathematics as a major.

8. College Algebra. (3) I. Tu Th S, 10. Sperry
Permutations and combinations, probabilities, binomial theorem, logarithms, convergency of series, complex numbers.

Digitized by Google

9. Differential and Integral Calculus. (5) II. M Tu W Th F, 9. IRWIN
Prerequisite: course 5.

The elements of the differential and integral calclus, with application to geometry and mechanics.

UPPER DIVISION COURSES

These courses are open to students in the lower division who have the necessary prerequisites.

Courses 5 and 9 are prerequisite to courses 112, 114. Course 9 is prerequisite to courses 109A–109B, 117, 120.

101. Elementary Geometry for Advanced Students. (3) II. NOBLE
M W F, 10. Prerequisite: courses 5 and 6.

Selected topics in elementary geometry, with particular emphasis on recent developments.

102. Elementary Algebra for Advanced Students. (3) I. NOBLE
M W F, 10. Prerequisite: courses 8 and 9.

Selected topics in elementary algebra, with particular reference to modern points of view.

104A–104B. History of Mathematics. (2–2) Yr. Tu Th, 11. CAJORI

A non-technical course, open to students who have some knowledge of the fundamental ideas of analytic geometry and calculus.

106. History of Physics. (2) II. M W, 11. CAJORI

Development of the experimental method, evolution of laboratories, critical periods in the history of hypotheses. A course designed for teachers. (Also listed as Physics 106.)

109A–109B. Calculus, Advanced Course. (3–3) Yr. MCDONALD
M W F, 9.

110A–110B. Advanced Calculus. (2–2) Yr. Tu Th, 8, 9. WOODS, NOBLE

The differential equations, both ordinary and partial, which occur most frequently in the applications, with special stress on approximate numerical solutions. Definite integrals, multiple integrals, theory and use of infinite series, applications to practical problems. Primarily for students of engineering.

111. Theory of Algebraic Equations. (3) II. M W F, 2. IRWIN

112. Solid Analytic Geometry. (3) I. M W F, 3. NOBLE

114. Advanced Analytic Geometry. (3) II. M W F, 3. NOBLE

Introduction to modern methods in analytic geometry.

117. Calculus of Finite Differences. (3) I. M W F, 8. BERNSTEIN

118. Algebra of Logic. (3) I. M W F, 10. BERNSTEIN

Mathematical development of the logic of Boole, with applications.

119. Differential Equations. (3) I. M W F, 2. IRWIN

120. Theory of Probability. (3) II. M W F, 8. BERNSTEIN

Digitized by Google

124. Vector Analysis. (3) II. Tu Th S, 10. HASKELL

125A–125B. Analytic Mechanics. (3–3) Yr. M W F, 9. HASKELL
Prerequisite: course 109A, and an elementary course in mechanics.

199A–199B. Honors Conference. Yr. M W, 11. HASKELL
Individual conferences with honors-students for their guidance in reading and research. Credit to be arranged.

GRADUATE COURSES

203A–203B. History of Fundamental Concepts of the Calculus and Fluxions. (2–2) Yr. Lectures and seminar. W F, 4. CAJORI

*204. History of Algebra. Seminar. (2). CAJORI

*205. History of Infinite Series. Seminar. (2). CAJORI

211A–211B. Higher Plane Curves. (3–3) Yr. M W F, 3. HASKELL

*212. Algebraic Surfaces. (3) II. LEHMER

*213. Synthetic Projective Geometry. (3). LEHMER

214. Geometry of Four Dimensions. (3) I. M W F, 1. LEHMER

216. Differential Geometry. (3) II. M W F, 1. SPERRY

*217. Projective Differential Geometry. SPERRY

218A–218B. Logic of Mathematics. (2–2) Yr. Tu Th, 8. BERNSTEIN
Analysis of the foundation principles of geometry and algebra. Designed especially for teachers and prospective teachers of mathematics.

221A–221B. Introduction to Modern Higher Algebra. (3–3) Yr. IRWIN
Tu Th S, 10.

*222. Theory of Functions of a Real Variable. IRWIN

223A. Partial Differential Equations. (3) I. Tu Th S, 9. PUTNAM
The important partial differential equations of applied mathematics.

223B. Special Analytic Functions. (3) II. Tu Th S, 9. PUTNAM
Definite integrals, gamma-function, hypergeometric function, Bessel's functions, elliptic integrals.

224A–224B. Functions of a Complex Variable. (3–3) Yr. McDONALD
M W F, 2.

*225. Elliptic Functions. NOBLE

*226. Elliptic Modular Functions. HASKELL

*231. Theory of Numbers. LEHMER

* Not to be given, 1920–21.

Digitized by Google

*233. Theory of Groups. Part I. HASKELL

Theory of groups of substitutions, with application to the theory of algebraic equations.

*234. Theory of Groups. Part II. HASKELL

Elements of continuous groups, with application to the theory of differential equations.

*235. Seminar in Group Theory. HASKELL

Geometry in the light of group-theory.

*237. Calculus of Variations. NOBLE

Mathematical Colloquium. LEHMER

Meetings for the presentation of original work by members of the staff and graduate students.

251. Special Study and Research. The STAFF

299. Mathematical Seminar. Thesis for the Master's Degree. McDONALD

Advanced students will be guided in reading and research; frequent reports will be required. The particular aim of the seminar will be the training of students in independent investigation.

300. Teaching of Mathematics in Secondary Schools. (3) I. CAJORI
M W F, 3.

History of methods of teaching mathematics and a critical inquiry into present-day tendencies. For seniors and graduate students. This course will be accepted in partial satisfaction of the requirement in education for the teacher's recommendation.

COURSES IN OTHER DEPARTMENTS

Methods of Least Squares. (See Astronomy 107.) EINARSSON

Interpolation, Use of Tables and Mechanical Quadratures. (See Astronomy 108.) EINARSSON

Theoretical Astronomy. (See Astronomy 206.) LEUSCHNER

* Not to be given, 1920–21.

Digitized by Google

MECHANICAL AND ELECTRICAL ENGINEERING

CLARENCE L. CORY, M.M.E., D.Eng., John W. Mackay Jr. Professor of Electrical Engineering and Dean of the College of Mechanics.

JOSEPH N. LECONTE, M.M.E., Professor of Engineering Mechanics.

BENEDICT F. RABER, B.S., Professor of Mechanical Engineering.

BALDWIN M. WOODS, Ph.D., Professor of Aerodynamics.

HERBERT B. LANGILLE, A.B., Associate Professor of Machine Design and Mechanical Drawing.

GEORGE L. GREVES, M.S., Assistant Professor of Electrical Engineering.

FLOYD H. CHERRY, B.S., Assistant Professor of Electrical Engineering.

ARTHUR B. DOMONOSKE, M.S., Assistant Professor of Mechanical Engineering.

BLAKE R. VANLEER, B.S., Instructor in Mechanical Engineering.

LLEWELLYN M. K. BOELTER, M.S., Instructor in Electrical Engineering.

GEORGE E. COX, Assistant in Mechanics and Foreman of Woodwork.

JAMES GEORGE, Assistant in Mechanics and Foreman of Ironwork.

—— ——, Lecturer on Marine Engineering and Naval Architecture.

Laboratory Deposits.—Mechanical Engineering 8A–8B, 9A–9B, $10 per half-year; 107, 109, $2.50 per half-year; 117A–117B, 119A–119B, $5 per half-year. Electrical Engineering 6A–6B, $2.50 per half-year; 100C–100D, 110C, $5 per half-year; 111C–111D, $10 per half-year. Sixty per cent of the amount of these deposits is retained as a fee and the balance after deductions for breakage or loss of apparatus is returned to the student.

Honors.—Students will be recommended for honors on the basis of the work done in the regular curriculum of the senior year. Particular emphasis will be placed on the thesis.

MECHANICAL ENGINEERING

LOWER DIVISION COURSES

1. Elements of Heat Power Engineering. (3) I. CHERRY, LANGILLE
Sec. 1, M W F, 8; Sec. 2, M W F, 9. Prerequisite: Physics 1A–1B, Mathematics 3A–3B.

Fundamental consideration of fuels, combustion, steam, boilers, furnaces, chimneys; steam engines, steam turbines and auxiliaries; internal combustion engines.

2. Descriptive Geometry. (3) Either half-year. CHERRY
Sec. 1, Tu Th S, 9–12; Sec. 2, Tu W Th, 1–4. Prerequisites: Drawing C or high school geometrical drawing. Prescribed alternately with Drawing 3D, sophomore year, Colleges of Engineering.

Lectures and drafting-room work upon the fundamental principles of descriptive geometry and their application to engineering problems.

Digitized by Google

6A. Machine Design. (3) II. LANGILLE
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4. Prerequisite: Mechanical Engineering 2 or Drawing 3D.

Elements of machine design. Work at the drawing board, supplemented by lectures upon the principles underlying mechanical drawing and machine construction.

7. Automobile and Truck Construction. (3) Either half-year.
Sec. 1, M W F, 9; Sec. 2, M W F, 1. DOMONOSKE

Illustrated lectures on typical details of automobile construction including engines, oiling, cooling and ignition; clutches, transmissions and rear axles. Designed to meet the demand for such knowledge as will facilitate intelligent driving and regular maintenance of automotive vehicles. Open to students with sophomore standing. Physics, including electricity and magnetism, while not prerequisite are highly desirable.

10. Automotive Laboratory. (2) Either half-year.
RABER, DOMONOSKE, BOELTER
Sec. 1, Tu, 1–5; Sec. 2, F, 1–5. Prerequisite: Mechanical Engineering 7.

Elementary work in the automotive laboratory.

8A–8B. Shop Work, Pattern Making. (2–2) Yr. COX
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 9–12; Sec. 3, Tu Th, 1–4; Sec. 4, W, 1–4, and S, 9–12.

Shop work in wood, including pattern making.

9A–9B. Shop Work, Machine Work in Iron. (2–2) Yr. GEORGE
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 9–12; Sec. 3, Tu Th, 1–4; Sec. 4, W, 1–4, and S, 9–12.

Shop work in iron, including machine work.

18. Summer Class in Shop Work. (3). COX, GEORGE
Six weeks, four days a week, 9–12, 1–4.

Shop work in wood and pattern making or in iron and machine work. Required for graduation in the College of Mechanics.

UPPER DIVISION COURSES

102A–102B. Engineering Mechanics. (3–3) Yr. LECONTE, WOODS
Secs. 1 and 2, M W F, 8; Sec. 3, M W F, 10. Prerequisite: Mathematics 3A–3B, 4A–4B, or 9 and 109A–109B.

A course in theoretical mechanics designed to meet the needs of students in engineering.

103A. Hydraulics. (3) I. M W F, 9. LECONTE
Prerequisite: course 102A–102B or Physics 105A–105B.

The principles of hydraulics with special reference to their application in the development of power.

Digitized by Google

103B. Hydraulic Machinery. (3) II. M W F, 9. LeConte
Prerequisite: course 103A or Civil Engineering 110.

Discussion of the theory underlying the design of hydraulic motors, pumps, and other apparatus operated through the agency of water.

103C–103D. Elementary Practical Hydraulics. (2–2) Yr. Vanleer
Tu Th, 11. Course 102A–102B must precede or accompany this course.

Practical problems upon cost of piping, well digging, selection of pumping machinery and central station pumping plants, windmills, etc. Reports upon visits to hydraulic installations; oral and written abstracts of engineering papers. Recitations.

104A–104B. Kinematics. (2–2) Yr. Tu Th, 11. Woods
Prerequisite: course 102A–102B or Physics 105A–105B.

Theoretical.—Motion without reference to the cause which produces it; pure mechanism or the mutual dependence of the movements in the parts of a machine.

Applied.—Application of the preceding to the various kinematic problems connected with machine design and construction, such as link-motion, transmission by rolling and sliding contact, teeth of wheels, cams, form and proportions of the steam engine and other motors.

104C–104D. Kinematics Drafting. (1–1) Yr. W, 1–4. Langille
To be taken only in conjunction with course 104A–104B.

105A–105B. Thermodynamics. (3–2) Yr. I. M W F, 10. II, M F, 10.
Raber, Domonoske
Prerequisite: junior standing in an engineering college.

105A. Relations between heat and mechanical energy. Thermal properties of perfect gases. Consideration of heat power engines using perfect gases, including the analyses of cycles, the thermodynamic calculations for designs, and the practical operating features of air compressors and air engines, gas, oil, and Diesel engines.

105B. Thermal properties of vapors. Consideration of heat power engines using vapors, including the analyses of cycles, the thermodynamic calculations for designs, and the practical operating features of reciprocating vapor engines and turbines.

106B. Machine Design. (2) I. Langille
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4. Prerequisite: course 6A.

Continuation of course 6A. Design of machine parts and of a typical machine suitable for illustrating the general principles of engineering design.

106C. Advanced Machine Design. (2) Either half-year. Langille
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4.

A continuation of course 106B, involving the complete design of a steam engine, air compressor or similar mechanism. Open as an elective course to students who have completed courses 6A and 106B. Completion of courses 102A–102B, 104A–104B, 104C–104D is particularly desirable as a preparation for this course. Course 104A and 104C may be taken concurrently.

Digitized by Google

107. Elementary Heat Power Laboratory. (1) Either half-year.
DOMONOSKE, BOELTER

Sec. 1, M, 1–4; Sec. 2, W, 1–4; Sec. 3, F, 1–4.

Prerequisite: junior standing in an engineering college, Mechanical Engineering 105A, or the latter may be taken concurrently.

Calibration of instruments and auxiliary apparatus used in testing. Tests of steam engine, steam pump, gas engine, air compressor, boiler, etc. Steam calorimetry. Fuel testing.

109. Hydraulic Laboratory—Experimental Engineering. (1) Either half-year.
VANLEER

Secs. 1, 2, W, 1–4; Secs. 3, 4, F, 1–4. Prerequisite: junior standing in an engineering college.

The general principles of hydraulics, including methods of measuring water, calibration of instruments, meters, weirs, nozzles and orifices, etc.

114A–114B. Thesis. (2–2) Yr.
The STAFF

For the regulations governing thesis work see the Circular of Information, Academic Departments. Candidates for B.S. who elect their thesis work in the Department of Mechanical and Electrical Engineering will register, during both half-years of the last or senior year, for course 114. Candidates who elect their thesis work in another department will register according to the announcement of that department.

115. Thermodynamics. (3) I. M W F, 8.
RABER, DOMONOSKE

Prerequisite: course 105A–105B.

Vapor cycles used for refrigeration. Calculations for designs and the practical operating features of refrigerating systems. Steam power plant layouts. Building up of load curves and the correlation of main and auxiliary units.

117A–117B. Advanced Heat Power Laboratory. (1–1) Yr.
RABER, DOMONOSKE, BOELTER

Sec. 1, M, 1–4; Sec. 2, Tu, 1–4; Sec. 3, Th, 1–4. Prerequisite: course 105A–105B.

Testing of prime movers as semi-Diesel internal combustion engines, steam engines and steam turbines. Boiler and plant tests. Analysis of heat losses from experimental results.

119A–119B. Hydraulic Laboratory—Experimental Engineering. (1–1) Yr.
VANLEER

Secs. 1, 2, M, 1–4; Secs. 3, 4, Tu, 1–4; Secs. 5, 6, Th, 1–4. Must be taken in conjunction with course 103A–103B. Prerequisite: course 109.

The general principles of hydraulic machinery, including tests of pumps, centrifugal, direct displacement, etc., tests of impulse and reaction turbines. Determination of windage and friction, impact and bucket losses, etc.

121. Aerodynamics. (3) II.
WOODS

The elements of the theory of motion in a fluid as they affect the design of the aeroplane; the fundamental parts of the machine, the use of model experiments, and the trend of aeroplane development

Digitized by Google

126. Steam Turbines. (2) Either half-year. LANGILLE
Prerequisite: Mechanical Engineering 1; course 105B may be taken concurrently.

Rotative heat power engines and their auxiliaries; design of steam nozzles, of blading, and of governor details. Turbine operation illustrated by inspection trips to typical plants. Open to seniors and graduate students.

GRADUATE COURSES

215A–215B. Advanced Problems in Hydraulics and Engineering Mechanics. (1–1) Yr. W, 11. LECONTE

Conditions of minimum loss in turbines, distribution of flow in channels, theory of vortex diffusers, problem of the surge pipe, theory of air lift and jet pump. Ballistics, interior and exterior, counterbalancing of reciprocating motors.

219. Mechanical Engineering: Research Laboratory. I. RABER
Prerequisite: courses 1, 105A–105B, or the latter may be taken concurrently.

221. Aerodynamics. (2) I. WOODS
Prerequisite: course 102, Mathematics 110.

The principles of motion in a fluid as applied to the aeroplane, and to the design of its fundamental parts.

ELECTRICAL ENGINEERING

LOWER DIVISION COURSES

1. Elements of Electrical Engineering. (3) II. CHERRY
Sec. 1, M W F, 8; Sec. 2, M W F, 9. Open to sophomores in the engineering colleges, especially those who have had Mathematics 3A–3B and Physics 4A.

6A–6B. Elements of Radio Engineering. (4–4) Yr. GREVES, ——
Lectures, M W F, 8; laboratory period to be arranged. Prerequisite: enrollment in Mathematics 3A and Physics 1A.

Lectures and recitations on the theory and operation of the electrical machines used in radio communication. Elements of the theory and practice involved in radio telegraphy and telephony.

UPPER DIVISION COURSES

100A. Direct Current Machinery. (2) I. Tu Th, 9. GREVES
Prerequisites: Mathematics 4A–4B; Physics 4A–4B.

Theory, operating characteristics, and uses of direct current machinery and equipment. For engineering students not registered in the College of Mechanics.

100B. Alternating Current Machinery. (2) II. Tu Th, 9. GREVES
Prerequisite: course 100A.

A continuation of course 100A. Theory, operating characteristics and uses of alternating current machinery and equipment. For engineering students not registered in the College of Mechanics.

Digitized by Google

100C. Electrical Laboratory: Direct Current Machinery. (1) I. GREVES
Sec. 1, M, 1–4; Sec. 2, W, 1–4; Sec. 3, F, 1–4; Sec. 4, S, 8–11. Course 100A must be taken concurrently.

100D. Electrical Laboratory: Alternating Current Machinery. (1) II. GREVES
Sec. 1, M, 1–4; Sec. 2, W, 1–4; Sec. 3, F, 1–4; Sec. 4, S, 8–11. Course 100B must be taken concurrently.

110A–110B. Electrical Machinery and Construction. (2–2) Yr. CORY
Tu Th, 11. Prerequisite: course 1B, Mathematics 4A–4B and Physics 4A–4B.

The construction and operation of electrical machinery, and its application to electric lighting and power distribution.

110C. Electrical Machinery and Construction: Laboratory. (2) II. GREVES
Sec. 1, M, 1–4; Sec. 2, Tu, 1–4; Sec. 3, W, 1–4; Sec. 4, Th, 1–4; Sec. 5, F, 1–4; Sec. 6, S, 8–11. Course 110B must be taken concurrently.

111A–111B. Alternating Currents and Alternating Current Machinery. (4–4) Yr. Tu Th, 9–11. CORY
Prerequisite: courses 110A–110B and 110C; Mechanics 102A–102B or Physics 105A–105B; Physics 107A–107B.

The theory of the generation of single-phase and poly-phase alternating currents, the use of the complex quantity, and the calculation of the regulation and behavior of alternating current apparatus and transmission lines. The theory of the single-phase and poly-phase induction motor, synchronous motor, and rotary converter, and their effects and operation in transmission systems.

111C–111D. Alternating Currents and Alternating Current Machinery: Laboratory. (3–2) Yr. GREVES
Sec. 1, Tu, 1–6; Sec. 2, Th, 1–6. Prerequisite: courses 111A–111B must be taken concurrently.

114A–114B. Thesis. (2–2) Yr. The STAFF
For the regulations governing thesis work see the Circular of Information, Academic Departments. Candidates for B.S. who elect their thesis work in the department of Mechanical and Electrical Engineering will register, during both half-years of the last or senior year, for course 114. Candidates who elect their thesis work in another department will register according to the announcement of that department.

115A–115B. Advanced Radio Engineering. Yr.
Prerequisites: Mathematics 4A–4B; Physics 4A–4B. Electrical Engineering 100ABCD or Electrical Engineering 110ABC and Mathematics 110AB should be taken concurrently.

The theory of radio circuits, apparatus and auxiliary equipment and their applications to radio telegraphy and telephony.

115C–115D. Advanced Radio Engineering: Laboratory. (2–2) Yr.

Digitized by Google

119A–119B. Elements of Electrical Design. Yr.

Theoretical principles underlying the construction and operation of electrical apparatus; applications of the principles to the practical design and general problems connected with direct and alternating current machinery and apparatus.

122A–122B. Special Undergraduate Study. Yr. The STAFF

Lectures, or selected topics for reading.

122C–122D. Special Undergraduate Study. Yr. The STAFF

Laboratory.

GRADUATE COURSES

212A–212B. Advanced Theoretical Electrical Engineering. (2–2) Yr.

Lectures on selected topics of an advanced technical nature dealing with electrical apparatus, the theory and use of the oscillograph, measurement and calculation of transmission line constants, and steady and transient phenomena in circuits having concentrated and distributed constants. Open to seniors and graduate students.

212C–212D. Electrical Engineering Research Laboratory. Yr. The STAFF

218A–218B. Special Graduate Study in Electrical Engineering. Yr. The STAFF

Selected topics for reading and discussion.

MARINE ENGINEERING AND NAVAL ARCHITECTURE

NOTE.—Lectures will be supplemented by visits to plants in actual operation.

101A–101B. Naval Architecture. (2–2) Yr. Tu Th, 8. ——

Prerequisite: junior standing in an engineering college or in architecture.

Areas, volumes, and centers of gravity of solids; displacement, center of buoyancy, metacenter, trim; coefficients (block, prism mid-area); sectional area curves, displacement tables, cargo capacities, flooding, tonnage, free board, launching, strains and stresses; equivalent girder, resistance to stress, stability.

102A–102B. Naval Architecture Drafting. (2–2) Yr. ——

Tu Th, 1–4.

Drafting and designing. To be taken in conjunction with course 101A–101B.

103A–103B. Marine Engineering. (2–2) Yr. Tu Th, 10. ——

Fire-tube and water-tube boilers; oil and coal firing. Reciprocating and turbine engines; valve diagrams; Diesel, semi-Diesel, and ordinary gas engines; shafting, propellers; horsepower, resistance and propulsion of ships.

Digitized by Google

104A–104B. Marine Engineering Drafting. (2–2) Yr. ——
Tu Th, 1–4.

Drafting and designing. To be taken in conjunction with course 103A–103B.

105A–105B. Nomenclature in Shipbuilding. (1–1) Yr. W, 11. ——

Names of the parts of a ship, calculations of rudders and davits; Classification Society's rules; civil service and other United States requirements.

106A. Construction and Operation of Ships. (2) Either half-year.
M W, 10. ——

Types of ships; displacement; tons per inch immersion; dead weight; load line; gross, net and under deck tonnage; stability in loading; homogeneous and liquid cargoes; shifting cargoes; Seamen's Act and correlated laws affecting the arrangement of ships; classification and insurance under Lloyds; types of machinery; speed and consumption; drydocking; operation; maintenance; chartering; customs clearance and entry. This course is arranged especially to suit the needs of the students in the College of Commerce.

MEDICAL SCHOOL

At present the instruction of the first one and one-half years of the medical course is given in Berkeley. The first year of this work may also be counted towards the bachelor's degree in the College of Letters and Science for those who have attained senior standing. See departments of anatomy, biochemistry and pharmacology, physiology, and pathology and bacteriology. For further information reference should be made to the special announcement of the Medical School.

Digitized by Google

MILITARY SCIENCE AND TACTICS

JOHN T. NANCE, Colonel, U. S. Army, Retired, Graduate U. S. Military Academy, Professor of Military Science and Tactics.

LEWIS K. UNDERHILL, Captain, Infantry, U. S. Army, A.B., Graduate U. S. Military Academy, Assitant Professor of Military Science and Tactics.

FREDERICK MCCABE, Captain, Infantry, U. S. Army, Assistant Professor of Military Science and Tactics.

NORMAN E. FISKE, Captain, Cavalry, U. S. Army, B.S., Assistant Professor of Military Science and Tactics.

—— ——, Assistant in Military Science and Tactics.

The courses in military training are those prescribed by the War Department for infantry units of the senior division of the Reserve Officers' Training Corps. The United States furnishes arms, equipment, uniforms, and some text books for the use of students belonging to such units. The University being responsible for text books and uniforms furnished by the United States requires the student to deposit with the Comptroller $33 to cover the cost of the text books and uniform issued him. This deposit must be made before the student files his study-list; the deposit is refunded at the close of the academic year or upon the student's withdrawal, provided the student then returns in good condition all articles issued him. An amount necessary to replace articles not returned by the student will be retained by the Comptroller.

Students who are members of the National Guard or of the U. S. Naval Reserve Force are authorized to wear their Guard or Navy uniform in their military training at the University, and, upon application to the Supply Officer at the Military Science Building, may be excused from paying the deposit for uniform. Such students will pay a deposit of $3 to cover cost of text books issued them.

The primary object of establishing units of the Reserve Officers' Training Corps is to qualify students for appointment in the Officers' Reserve Corps of the United States Army. Students who complete the advanced (upper division) course, and who participate in such summer camps as the Secretary of War may prescribe, are eligible upon graduation for appointment and commission by the President in the Officers' Reserve Corps, which is intended to furnish a great part of the commissioned personnel for the temporary forces which this nation will require in time of emergency.

Students who complete the advanced course are also eligible to commission by the Governor of the State of California in the University Cadets.

The courses are divided into two groups, the lower division or basic courses and the upper division or advanced courses.

Digitized by Google

Preparation for the Major

Required: Military 1A–1B (3), 2A–2B (3); Hygiene 1 (1); Physical Education, prescribed courses.

Recommended: Jurisprudence 10A–10B (4) or 18A–18B (5); History 4A–4B (6), 8A–8B (6); Political Science 1A–1B (6); French or German or Spanish.

Lower Division Courses

The lower division or basic courses are prescribed for all first-year and second-year undergraduate male students who are citizens of the United States, able-bodied and under twenty-four years of age at the time of admission to the University. A first-year or second-year student claiming exemption because of non-citizenship, physical disability or age will present to the Department of Military Science and Tactics a petition, on the prescribed form, for such exemption. Pending action on his petition the student will enroll in the courses prescribed for his year and enter upon the work of such courses.

1A–1B. Basic Military Training (first year). (1½–1½) Yr.
Nance, Underhill, McCabe, Fiske, Assistants and Cadet Officers
M W, 11, alt. W, 4, and 2 half-day periods. Beginning either half-year.

Instruction and practice in organization, infantry drill, field exercises, ceremonies, military courtesy and discipline, care of rifle, rifle firing, bayonet combat, interior guard, first aid and minor tactics.

2A–2B. Basic Military Training (second year). (1½–1½) Yr.
Nance, Underhill, McCabe, and Fiske, Assistants and Cadet Officers
M W, 11, alt. W, 4, and 2 half-day periods. Beginning either half-year.

Continuation of course 1A–1B, and instruction and practice in signaling, topography and field engineering.

Upper Division Courses

The upper division or advanced courses are prescribed for such third-year and fourth-year students as have completed the basic courses and elect to continue their military training and who are appointed officers of University Cadets.

Any member of the senior division of the Reserve Officers' Training Corps who has completed two academic years of service in that division, who has been selected for further military training by the president of the institution and the professor of military science and tactics, and who executes the following written agreement, will be entitled, while not subsisted in kind, to the commutation of subsistence fixed by the Secretary of War in accordance with law.

....., 192.....

In consideration of commutation of subsistence to be furnished me in accordance with law, I hereby agree to continue in the Reserve Officers' Training Corps during the remainder of my course in .....,
(*Institution*)

Digitized by Google

to devote five hours per week during such period to the military training prescribed, and to pursue the courses of camp training during such period, prescribed by the Secretary of War.

The course of camp training is for six weeks during the summer vacation normally following the student's completion of the first year of the advanced course. The United States furnishes uniform, transportation and subsistence for students attending the training camp.

Cadet officers and, so far as practicable, sergeants of the unit will be appointed from members of the junior and senior classes.

Students desiring to enroll in upper division courses who are unable to conform to the following schedule are advised to consult the head of the department.

103A–103B. Advanced Military Training (third year). (3–3) Yr.
NANCE, UNDERHILL, MCCABE, and FISKE
M W, 11; W, 4; Th, 3; 2 half-day periods and 4 two-hour periods.

Practice in the duties of cadet officers and in teaching, in connection with courses 1A–1B and 2A–2B; topography, field engineering, minor tactics, administration, hippology, laws of war.

Continuation of course 103A–103B, and exercises in military law,

104A–104B. Advanced Military Training (fourth year). (3–3) Yr.
NANCE, UNDERHILL, MCCABE, and FISKE
M W, 11; W, 4; Th, 3; 2 half-day periods and 4 two-hour periods.

Continuation of course 103A–103B, and exercises in military law, military history and military policy.

Digitized by Google

MINING AND METALLURGY

FRANH H. PROBERT, A.R.S.M., Professor of Mining, Dean of the College of Mining.

ERNEST A. HERSAM, B.S., Associate Professor of Metallurgy.

WALTER S. WEEKS, M.E., Associate Professor of Mining.

LESTER C. UREN, B.S., Associate Professor of Petroleum Engineering.

WALTER S. MORLEY, B.S., Associate Professor of Metallurgy.

—— ——, Instructor in Mining.

Honors.—Students will be recommended for honors at graduation on the basis of the quality of work done in the regular curriculum of the senior year. Particular emphasis will be placed upon the student's capacity for original work.

Vacation Work.—All students are required to work eight weeks, prior to senior standing, in a mine, mill, smelter, or oil field, of which two weeks shall be spent in collecting data for a report to be submitted to the Department of Mining and Metallurgy. Two units of credit will be given for this report.

For the regulations governing thesis work see Circular of Information, Academic Departments. Candidates for B.S. in mining, metallurgical or petroleum engineering may, with the approval of the study-lists committee, submit a thesis based on field studies.

MINING

There are no laboratory fees in this department.

LOWER DIVISION COURSES

1A. Mine Surveying. (2) I. WEEKS
Tu Th, 9–12. Prerequisite: Civil Engineering 1A–1B, 3. To be taken concurrently with course 1B.

Surface and underground mine surveys; methods of traversing and collecting details.

1B. Mine Mapping. (1) I. W, 1–4. ——

Preparation of mine maps from survey data, and methods of representing geological and other features on mine maps. Drafting-room practice.

1C. Mine Mapping. (1) II. W, 1–4. ——
Prerequisite: course 1B.

Continuation of course 1B. Preparation of graphic records of engineering data; stoping charts, sampling diagrams, geologic maps and sections, and bore-hole logs. Use of special instruments. An intimate study of the several types of mine models.

Digitized by Google

5. Engineering Drawing. (2) II. ——
M W, M F, or W F, 1–4. Prerequisite: high school geometrical drawing.

Drafting-room practice, supplemented by occasional lectures, designed to meet the needs of mining students. Lettering; orthographic projection; preparation of working drawings and metallurgical flow sheets; graphical methods of representing engineering data; copying processes.

UPPER DIVISION COURSES

101. Mine Development and Mining Methods. (3) II. PROBERT
M W F, 9. Prerequisite: course 103; Mechanics 102A–102B or Physics 105A–105B.

Preliminary development, prospect and assessment work; choice of permanent entry; shaft sinking, tunneling, underground exploration. Support of excavations. Factors determining methods of mining. Modern practice in exploitation of veins, beds and massive deposits.

103. General Mining. (2) I. Tu Th, 11. PROBERT
Prerequisite: Geology 1A, Mineralogy 1A, 1B.

History of mining; importance of industry in modern civilization; prospecting; classification of mining methods, surface mining including placering and open pit work; mining non-metallic minerals, and an introduction to metal mining practices.

105. Mine Equipment. (3) II. M W F, 8. WEEKS
Prerequisite: course 101, Mechanics 1, 102A–102B, Electrical Engineering 100AB–100CD, Civil Engineering 108A. Course 111B to be taken concurrently.

General discussion of power and mine equipment; transportation; hoisting, pumping, ventilating, and lighting.

107. Economics of Mining. (3) I. M W F, 10. PROBERT
Prerequisite: senior standing.

Mining—a business. Land, labor and capital in mining. The economic operation of a mine. The public domain and acquisition of mineral lands. Company incorporation and organization; stocks, bonds and market tendencies; mine taxation; marketing ores and metals. Labor, employment, management, labor organizations. Conservation of natural resources. Production and consumption. Political and commercial control. Relation of mining to other industries.

109. Mine Cost-Accounting. (2) II. Tu Th, 8. UREN

Lectures on mine accounting and cost-keeping from an engineering standpoint. Payment of workmen; purchase and distribution of mine supplies; production records; administrative reports; methods of filing and preparing engineering and statistical data. To be taken concurrently with course 101.

111A. Mining Machinery: Compressed Air. (4) I. WEEKS
M Tu W, 1–4. Prerequisite: Mechanics 1, Electrical Engineering 100AB–100CD.

Lectures, computations and laboratory. The compression of air and use of compressed air for mining purposes.

Digitized by Google

111B. Mining Machinery and Supplies. (3) II. M W, 1–4. WEEKS
Prerequisite: course 111A; course 105 to be taken concurrently.

Lectures, computations and laboratory. Power, mine ventilation, pumping, lighting, signaling, explosives, etc.

117A–117B. Undergraduate Thesis Course. (2–2) Yr. ——
In special cases a student may, with the approval of the study-lists committee, submit as a thesis a piece of work in any department in which he is qualified to pursue advanced studies.

Mining law is given in the Department of Jurisprudence (see Jurisprudence 216).

GRADUATE COURSES

201. Research in Mining Practice. I. WEEKS
Prerequisite: courses 101, 105, and 111A, 111B.

205. Mine Valuation. (2) II. Tu Th, 9. PROBERT
Prerequisite: courses 101, 105 and 107. Open also to qualified seniors who are taking courses 101 and 105.

Lectures on the examination, sampling and valuation of mines.

299. Thesis for the Master's Degree.

PETROLEUM ENGINEERING

UPPER DIVISION COURSES

Course 115 is prerequisite to courses 119, 123, 129.

115. Oil Field Development. (2) I. Tu Th, 11. UREN
Prequisite: senior standing in any engineering college; open to seniors in Letters and Science whose major is geology.
Prospecting for oil. Methods of drilling and controlling oil wells.

119. Petroleum Production Methods. (2) II. Tu Th, 11. UREN
Prerequisite: course 115.

Methods of extracting oil from wells. Separation of water, sand and gas from oil. Transporting and storing petroleum. Economics of the oil industry. Valuation of oil lands.

123. Petroleum Engineering Laboratory. (2) II. Tu Th, 1–4. UREN
Investigation of special problems in the production, transportation and storage of petroleum. Practice in testing petroleum. Course 119 to be taken concurrently.

125. Petroleum Cost Accounting. (1) I. Tu, 8. UREN
Oil field cost-keeping and accounting methods. Payment of workmen; purchase and distribution of supplies; production records and administrative reports. To be taken only in conjunction with course 115.

Digitized by Google

127. Petroleum Utilization. (1) I. F, 10. UREN
Prerequisite: junior standing in an engineering college; open also to seniors in Letters and Science whose major is geology.

Use of petroleum and its derivatives as fuels; mineral oil lubricants, their characteristics and uses; refined distillates and their uses in furnishing light and heat; asphalt and its uses in paving and structural work; the mineral waxes and their uses. Lectures.

129. Production and Utilization of Natural Gas. (1) II. F, 9. UREN
Control and management of gas wells; separation of gas from oil; compression and transmission of natural gas; its utilization in developing light, heat, and power; extraction of gasoline from natural gas.

131A–131B. Undergraduate Thesis Course. (2–2) Yr. UREN
In special cases a student may, with the approval of his study-lists committee, submit as a thesis a piece of work in any department in which he is qualified to pursue advanced studies.

GRADUATE COURSE

207A–207B. Research in Petroleum Technology. Either half-year. UREN
Prerequisite: courses 115, 119 and 123. Hours and credit to be arranged.

METALLURGY

Laboratory deposits of $15 per half-year are required in Metallurgy 2, 104A, 104B, 110A, 110B, and 116. After deducting for cost of materials actually used and the breakage of apparatus the balance is refunded.

LOWER DIVISION COURSES

2. Wet Assaying. (3) II. M, 10; Tu Th, 1–4. MORLEY
Prerequisite: Chemistry 1A–1B.

The principles and practice of wet assaying and volumetric analysis applied to the products of mine, mill, and smelter.

UPPER DIVISION COURSES

102. General Metallurgy. (2) II. Tu Th, 8. HERSAM
Prerequisite: course 2 or Chemistry 5 or 6A, Physics 1A–1B, 4A–4B, Mineralogy 1A.

The study of ores from a metallurgical standpoint. Sorting, concentrating, handling, sampling, and valuing ores and ore products; slags, fluxes and refractory materials. Metallurgical practices and the outline of standard process of treatment.

104A. Fire Assaying. (3) I. F, 10; M Tu, 1–4. MORLEY
Prerequisite: course 2, and Mineralogy 1A, 1B.

The proper use and care of the balance. Cupellation and parting of gold and silver. Preparation of ore samples. Scorification and crucible assays of gold and silves ores.

Digitized by Google

104B. Advanced Assaying. (2) II. M F, 1–4. MORLEY
Prerequisite: course 104A.

Lectures and laboratory practice in the assay of precious and base metal ores. Melting, refining and sampling of gold and silver bullion. The assay of alluvials for gold, silver, platinum and tin. Smelting practice and analysis of products.

106. Metallurgy of Iron and Steel. (2) II. Tu Th, 10. HERSAM

The ores of iron and the methods of their reduction. The production of pig iron, wrought iron, and the various grades of steel. The physical properties of structural iron and steel as related to chemical composition and metallurgical treatment.

108A. Ore Dressing—Lectures. (2) I. M W, 10. HERSAM
Prerequisite: courses 102 and 104A.

The mechanical treatment of ores; the leading practices relating to crushing, sizing, classification, amalgamation, flotation and the various processes of concentration; theory of mechanical separation; principles underlying the possibilities of ore separation.

108B. Metallurgy of Gold and Silver. (2) II. M W, 8. HERSAM
Prerequisite: course 108A.

Lectures on the milling and amalgamation of gold and silver ores. The cyanide and other processes of extracting precious metals. Roasting and chlorination. A detailed study of existing plants.

110A. Ore Dressing—Laboratory. (2) I. Th F, 1–4. HERSAM
Prerequisite: course 102. Supplementary to course 108A.

The operations of ore dressing. Practice in crushing, sampling, and concentrating the ores of gold, silver, and the base metals. Experimentation on a working scale.

110B. Metallurgical Laboratory. (2) II. Th F, 1–4. HERSAM
Prerequisite: course 110A. Supplementary to course 108B.

Experiments in amalgamation, flotation and hydro-metallurgy of precious and base-metal ores.

112. Metallurgy of Lead and Copper. (2) I. Tu Th, 11. MORLEY
Prerequisite: course 102.

Methods of smelting lead and copper ores with particular reference to the gold and silver content. A study of furnaces and the principles of their construction.

116. Metallography. (2) Either half-year. MORLEY
I, Tu, 9, W, 1–4; II, Tu, 11, W, 1–4. Prerequisite: course 106.

The microscopic structure of metals and alloys as related to their physical and chemical properties, with special attention to iron and steel. Practice in the use of the microscope as applied to the examination of polished and etched metallic surfaces. Instruction in photomicrography. Lectures and laboratory.

118A–118B. Undergraduate Thesis Course. (2–2) Yr. ——

In special cases a student may, with the approval of the study-lists committee, submit as a thesis a piece of work in any department in which he is qualified to pursue advanced studies.

Digitized by Google

Graduate Courses

The foregoing undergraduate courses are open to graduate students whose previous preparation has fitted them to undertake the work.

202. Metallurgy of the Less Common Metals. (2) I. M W, 11. Hersam
Prerequisite: course 112.

The metallurgical treatment of the ores of tin, zinc, antimony, arsenic, mercury, aluminum, and the platinum metals, including methods of reduction and refining these metals.

210A–210B. Special Investigation in Treatment of Ores. Yr. Hersam
M Tu, 1–4. Prerequisite: course 110B.

Programme of work to be arranged in each case.

216. Advanced Metallography. (2) II. Th, 1–5. Morley
Prerequisite: course 116.

An extended study of the structure of iron and steel, including thermal analysis. The metallographic examination of the industrial alloys.

Digitized by Google

MUSIC

EDWARD G. STRICKLEN, Assistant Professor of Music.
VIRGINIA GRAHAM, Instructor in Music.
PAUL STEINDORFF, Choragus.
LEROY W. ALLEN, B.S., Assistant in Music.

PREPARATION FOR THE MAJOR

Required: Music 4A–4B (6 units), 5A–5B (6), 7A–7B (4), 6A–6B (4).

Recommended: one year each of choral singing, musical history, ear-training; two years' study of a musical instrument.

Students who plan to specialize in music should confer with the head of the department at the beginning of the freshman year, in order to ensure the fulfillment of the departmental prerequisites in the lower division (courses 4A–4B, 7A–7B, 6A–6B and 5A–5B or their equivalent—knowledge of the theory and skill in the practice of elementary diatonic and chromatic harmony and strict counterpoint in five parts). The upper division courses are: in composition, 104A–104B and 105A–105B; in performance, 109A–109B (in special cases, one-half of course 101 or 102A-102B may be taken in place of course 109B); in musicology, 111A–111B and 112A–112B (these courses are given in alternate years).

Honors-Students in the Upper Division.—Students in the honors-group who have completed the major in music with distinction may receive honors at graduation by showing ability to do original work either in composition or in a thesis upon a musicological subject. Honors-students will be allowed special privileges in the use of the library and the music building.

Five-Hour Courses.—The schedule contemplates the combination of certain two- and three-hour courses of complementary character in a five-hour series, with the following plans of enrollment: 4A–4B, 7A–7B; 5A–5B, 6A–6B; 102A–109A.

Composition

Notice to All Students.—Ear-training, by practice in sight singing and in dictation, will be given as part of the regular work in courses 4A, 4B. Students in all courses (course 3A alone excepted) may, without preliminary notice, be examined by the department in regard to their abilities in this respect and required to make good any deficiencies.

LOWER DIVISION COURSES

1A–1B. Choral Practice. (1–1) Yr. Tu Th, 1. STEINDORFF

Any student in the University with a good singing voice may attend the meetings and take part in the final concert or operatic performance.

2A–2B. Orchestral Practice. (1–1) Yr. W, 7 p.m. STEINDORFF

Digitized by Google

3A–3B. General History of Music. (3–3) Yr. M W F, 10.

Lectures, reading and illustrative programmes of vocal, instrumental, and ensemble music.

4A–4B. Diatonic Harmony. (3–3) Yr. M W F, 9. GRAHAM

Prerequisite: familiarity with the symbols and terminology of musical notation together with a knowledge of intervals and simple metrical types (matriculation subject 10*a*).

Treatment of the complete diatonic resources of the major and minor modes, including the simpler modulations.

5A–5B. Chromatic Harmony. (3–3) Yr. M W F, 10. STRICKLEN

Prerequisite: course 4A–4B.

6A–6B. Musicianship. (2–2) Yr. Tu Th, 2. STEINDORFF

Primarily for students who have studied or are studying the technique of an instrument or of the singing voice.

7A–7B. Strict Counterpoint. (2–2) Yr. Tu Th, 9. STRICKLEN

Prerequisite: same as for Music 4A–4B.

A one-year course in the fundamentals of contrapuntal writing, based on the classical traditions of musical procedure. Must be taken by all students who intend to make music their major subject. It should be taken concurrently with course 4A–4B, but may, with the consent of the department, be taken concurrently with 5A–5B. Students with an adequate knowledge of strict counterpoint who desire to specialize in music may be excused from taking this course upon passing a satisfactory examination in its material.

9. Ear Training. (2) Either half-year. M W, 1. GRAHAM

Drill work in sight-singing, rhythm, and dictation. Elements of musical notation. Primarily for students who wish to remove deficiencies regarding the simpler aspects of musical perception.

11A–11B. Elementary Band Practice. (1–1) Yr. ALLEN

Th, 7:30–9:30 p.m.

A preparatory course for 12A–12B. Open to students who have a fair knowledge of musical notation, as well as some experience in playing a band instrument. The study of elementary band selections by means of ensemble and group practice.

12A–12B. Advanced Band Practice. (1–1) Yr. M, 4–6. ALLEN

Prerequisite: course 11A–11B or its equivalent, ability to read and play band music of superior grade.

Advanced studies in band playing by means of ensemble and group practice.

Performance

NOTE.—Instruction in singing and in the technique of all instruments is offered in the Division of University Extension both in San Francisco and in Oakland. (See "Announcement of Courses in Music," Division of University Extension.)

Digitized by Google

UPPER DIVISION COURSES

*101. Concert Repertoire. (1) Either half-year.
Prerequisite: course 11A–11B or exceptional vocal technique.

102A–102B. Piano Ensemble Practice. (2–2) Yr. F, 2–4. STEINDORFF
Eight-hand symphonic arrangements. Open only to students who possess exceptional technique and who practice one hour or more every day.

104A–104B. Contrapuntal Studies. (3–3) Yr. Tu Th S, 10. STRICKLEN
Prerequisite: courses 5A–5B, 7A–7B.
Double and triple counterpoint; elementary canon and fugue.

105A–105B. Composition. (2–2) Yr. Tu Th, 1. STRICKLEN
Prerequisite: course 104A–104B.

109A–109B. Conducting. (2–2) Yr. Tu Th, 3. STEINDORFF
Prerequisite: course 5A–5B. Course 6A may, unless previously taken, be required as supplementary study without credit in this course.

111A–111B. History of Music. (3–3) Yr. M W F, 1. STRICKLEN
Prerequisite: course 5A–5B. Students must have completed course 104A–104B or else be taking it concurrently with this course.
Pro-seminar. Introduction to the Critique of Music.

*112A–112B. Form. Pro-seminar. Introduction to the science of music.

113A–113B. Advanced Musical Analysis. (2–2) Yr. STRICKLEN
M W, 11. Prerequisites: courses 5A–5B and 7A–7B.
Class work in the analysis of the characteristic harmonic, contrapuntal and formal devices of the best masters of the classic, romantic and modern periods.

114A–114B. Band Instrumentation. (2–2) Yr. Tu Th, 4. ALLEN
Prerequisite: courses 4A–4B, 5A–5B, 7A–7B.
Practical experience derived from courses 11A–11B and 12A–12B or their equivalent will be of assistance, but is not essential. The theory and practice of writing and arranging music for the military band.
This course is especially recommended to students who intend to do professional work in connection with the organization and direction of public school bands.

Musicology

NOTE.—While not required, certain courses in anthropology, philosophy, historical and scientific methods, logic, psychology, social psychology, physics and literary criticism are practically essential to specialization in musicology.

* Not to be given, 1920–21.

Digitized by Google

300A–300B. Teaching of Music. (3–3) Yr. M W F, 1.
STRICKLEN, GRAHAM

Technical skill as well as mature knowledge of the subject is required of the prospective teacher; the student will therefore be given separate final examinations inquiring into the systematization of musical knowledge and the ability to impart it under the exacting conditions of the modern school, as follows: (1) sight reading and dictation, (2) composition, (3) history of music, (4) pianoforte technique, (5) singing, (6) conducting.

GRADUATE COURSE

201A–201B. Elements of Orchestration. (2–2) Yr. Tu Th, 2. STRICKLEN
Prerequisite: courses 104A–104B, 105A–105B, and approval of instructor.

Digitized by Google

ORIENTAL LANGUAGES

EDWARD T. WILLIAMS, M.A., LL.D., Agassiz Professor of Oriental Languages and Literature.

JOHN FRYER, LL.D., Professor of Oriental Languages, Emeritus.

YOSHI S. KUNO, M.S., Assistant Professor of Japanese.

†S. C. KIANG, Instructor in Chinese.

TSING HUA CHEN, Assistant in Chinese.

PREPARATION FOR THE MAJOR

Required: Chinese 3A–3B (6), 3C–3D (6), 8A–8B (4), 10A–10B (2); or Japanese 9A–9B (6), 9C–9D (6), 2A–2B (4), 12A–12B (2).

Some of the courses are accepted by the College of Commerce and other colleges as part of their regular curricula or as equivalents for prescribed work. Students who wish to take up Oriental studies may therefore find it to their advantage to consult with the dean of their college as to the arrangements that can be made in that direction.

In addition to the lecture and language courses mentioned below, the head of the department will offer special assistance to students who wish to take up other branches of study connected with China and Japan. He will also act as advisor to students coming from or going to the Orient.

LOWER DIVISION COURSES

Language Courses

*1A–1B. Lectures on Chinese Culture. (2–2) Yr. W F, 1.

Historical sketch of Chinese thought, its influence on the individual life and on society, and its place in the world civilization. (A) Chinese philosophy and religions; Confucianism, Taoism and other schools of teaching, also the imported systems of Buddhism, Taoism and Christianity. (B) Chinese literature and art.

2B–2B. Japanese Conversation for Beginners. (2–2) Yr. KUNO

M W F, 8. Prerequisite: course 9A. May be taken in connection with course 9B, 9CD.

3A–3B. Elementary Kuan-hua. (3–3) Yr. M W F, 9. WILLIAMS

Introduction to Kuan-hua, the language spoken, with slight variations, by the officials and about four-fifths of the population of China. Series of progressive, elementary lessons and exercises in reading, speaking and translation.

3C–3D. Second-year Kuan-hua. (3–3) Yr. M W F, 3. WILLIAMS

8A–8B. Elementary Chinese Conversation. (2–2) Yr. M W F, 10. CHEN

Practical exercises in the use of Kuan-hua.

† Absent on leave, 1920–21. * Not to be given, 1920–21.

Digitized by Google

9A–9B. First-year Elementary Japanese. (3–3) Yr. M W F, 9. KUNO

Introduction to the Japanese language, with the use of both the Katakana and Hiragana forms of letters. Series of progressive elementary lessons and exercises in reading, writing and speaking.

9C–9D. Second-year Elementary Japanese. (3–3) Yr. KUNO
M W F, 10.

Continuation of 9A–9B, introducing the use of common Chinese characters with selections from Japanese newspapers and modern Japanese authors.

10A–10B. Chinese Character Writing. (1–1) Yr. M, 1–3. CHEN

12A–12B. Japanese Character Writing. (1–1) Yr. S, 8–10. KUNO

Instruction in handling the brush, in making the various strokes, in forming the characters, and in different styles of writing.

UPPER DIVISION COURSES

Language Courses

*103A–103B. Elementary Study of the Chinese Written Language, Ancient and Modern. (3–3) Yr. WILLIAMS

*104A–104B. Advanced Study of Kuan-hua. (3–3) Yr. M W F, 10. ——

Series of progressive advanced lessons and exercises in reading, speaking, and translation.

105A–105B. Elementary Study of the Classics and the Written Language of Japan. (2–2) Yr. Tu Th, 11. KUNO
Prerequisite: course 110A–110B.

Progressive selections from current literature and from standard Japanese classics and poetical works.

*106A–106B. Advanced Study of Japanese Classics. KUNO
Prerequisite: course 105A–105B. May be repeated without duplication of credit.

Interpretation of Hōjō-ki, Tsure-zuregusa, and Makura-no-sōshi.

107A–107B. Popular Reading Course in Japanese. (1–1) Yr. Tu, 2. KUNO

Designed primarily for California-born Japanese and students of other nationalities who desire to attain facility in reading modern literature, magazines, and newspapers. May be repeated without duplication of credit.

*108A–108B. Advanced Chinese Conversation. (2–2) Yr. ——
M W, 11, and a third hour.
Prerequisite: course 8A–8B, or some practice in conversation.

*110A–110B. Advanced Study of the Japanese Spoken Language.
(3–3) Yr. KUNO
Prerequisite: course 9C–9D.

Series of progressive advanced lessons in reading, speaking, writing, translation, and composition.

---

* Not to be given, 1920–21.

Digitized by Google

112A–112B. Chinese Classics (Chinese Text). (1–1) Yr. W, 11. WILLIAMS
Readings from the Four Books, the Five Classics and other standard works. May be repeated without duplication of credit.

*113A–113B. Reading of a Chinese Text. (2–2) Yr. ——

*130A–130B. Chinese Composition. (2–2) Yr. M F, 1. ——
Prerequisite: some knowledge of the modern written language.
Writing of letters and short essays.

Lecture Courses

109A–109B. History of Japanese Political Development and Civilization. (2–2) Yr. Sec. 1, Tu Th, 1; Sec. 2, M W, 11. KUNO
Prerequisite: junior standing.

Prominent historical characters and events will be treated in chronological order, so as to give a general view of the history of Japan. Stress will be placed upon her political and social evolution and the development of her civilization. About 700 pages of outside reading are required in this course.

121A–121B. Japanese Life and Culture. (1–1) Yr. Th, 2. KUNO
Prerequisite: course 109A or 109B.

The social, economic and home life of Japan will be treated. Considerable outside reading required.

*122A–122B. Japanese Religions and Ethics. (1–1) Yr. F, 2. KUNO
Prerequisite: course 109A–109B.

The development of Shintoism, Confusianism, Buddhism, Christianity, and the modern Ethical System in Japan and their effect on her civilization.

*123A–123B. Japanese Art; Poems and Folk-lore. (1–1) Yr. F, 2. KUNO

*124A–124B. International Relations of Oriental Countries. (1–1) Yr. F, 2. KUNO

The political and intellectual relations of Japan, China, and Korea, and their diplomatic relations with Occidental powers. From 400 to 500 pages of outside reading and a term paper of about 3500 words are required.

NOTE.—Courses 121, 122, 123, and 124 will form a series to be given in successive years.

*126A–126B. The Religions of China. (2–2) Yr. M W, 10. ——

*127. Chinese Industrial Art. (1) I. Continuation of 126A–126B.

128A–128B. Social and Economic Conditions of China. (1–1) Yr. S, 9. WILLIAMS

129A–129B. Chinese History. (2–2) Yr. Tu Th, 9. WILLIAMS

*150A–150B. The Chinese Great Books. (2–2) Yr. ——
Chinese philosophies and general literature.

* Not to be given, 1920–21.

Digitized by Google

Graduate Courses

201A–201B. Review of New Books on China and Research. (2–2) Yr. Tu, 10–12. Williams

Reviews of new books on China, research work, and reports by the students on assigned subjects.

203A–203B. Research and Critical Study of Modern Topics and of Books on Japan. (2–2) Yr. S, 10–12. Kuno

Prerequisite: at least senior standing, and the completion of 6 units in upper division courses in the department.

Class work will consist of lectures by the instructor and reports by students. May be repeated without duplication of credit.

PALAEONTOLOGY

John C. Merriam, Ph.D., Professor of Palaeontology and Historical Geology, and Dean of the Faculties.

Bruce L. Clark, Ph.D., Assistant Professor of Palaeontology.

Chester Stock, Ph.D., Instructor in Palaeontology.

Eustace L. Furlong, Assistant in Palaeontology.

Announcements will be made later.

Digitized by Google

PATHOLOGY AND BACTERIOLOGY

FREDERICK P. GAY, A.B., M.D., Professor of Pathology.

GLANVILLE Y. RUSK, A.B., M.D., Associate Professor of Pathology.

IVAN C. HALL, A.B., M.S., Associate Professor of Bacteriology.

T. D. BECKWITH, Ph.D., Assistant Professor of Experimental Pathology.

FRANK B. ROSSON, M.D., Instructor in Pathology.

RUTH L. STONE, Ph.D., Instructor in Pathology.

JEANETTE N. GAY, M.S., Edith Claypole Memorial Research Fellow in Pathology.

LEWIS F. MORRISON, A.B., Assistant in Bacteriology.

——— ———, Assistant in Pathology.

Four Student Assistants in Bacteriology.

PREPARATION FOR THE MAJOR

Required: Bacteriology 1 (4); Chemistry 1A (5); Zoology 1A (4), 4, (1); Botany 2A–2B (6); Physics 2A–2B (6); French or German.

Recommended: Chemistry 1B (5); 8 (3), 9 (3).

Honors-students in the Upper Division.—Students in the upper division will be nominated by request to candidacy for honors on the basis of thoroughly satisfactory work in course 101. Honors will be recommended only for candidates who present a satisfactory thesis covering investigation in course 102 and whose record in other biological subjects is at least thoroughly satisfactory.

12 units in courses 101, 102 and 103 must be included in the major in bacteriology; 12 units of related subjects chosen by consultation with the instructor in charge of the student's work in the department may be applied toward the required 24 units.

The courses listed are given in Berkeley unless otherwise stated.

LOWER DIVISION COURSE

1. General Bacteriology and Microbiology. (4) II.
HALL, MORRISON, and Student Assistants

Lectures, Tu Th, 8; laboratory: Sec. 1, M W F, 9–11; Sec. 2, M W F, 1–3; Sec. 3, Tu Th S, 10–12.

Prerequisite: Chemistry 1A. Fee, $10. Deposit, $5, subject to refund, less deduction for breakage at end of half-year.

History of bacteriology; morphology, classification, ecology, and metabolism of micro-organisms; sterilization; preparation of cultural media; microscopic examination, cultivation and identification of bacteria; introduction to microbiology of air, water, soil, foods (including milk), industrial processes, and certain human, animal and plant diseases.

Digitized by Google

UPPER DIVISION COURSES

101. Micro-organisms in their Relation to Disease. (7) I.
GAY, HALL, BECKWITH, STONE, MORRISON

Lectures, M Tu W Th F, 1; laboratory, M W F, 2–5, Tu Th, 2–4. Fee and deposit for non-medical students: fee, $10; breakage and material, $10, subject to refund less deduction at end of half-year.

The comparative etiology of disease with particular study of the animate agents thereof, the pathogenic bacteria and protozoa. The evolution of infectious diseases in the animal body (infection) and study of the methods of bodily defense against them (immunity). Study, gross and microscopic of the primary changes in fluids and tissues in experimental disease of infectious and non-infectious origin (experimental pathology).

The work consists of lectures and laboratory work. The laboratory work includes an outlined course and assigned problems. Required of all medical students. May be taken, with the consent of the instructor, by a few non-medical students who have passed Bacteriology 1 with high standing. The latter students should preferably have had training in comparative anatomy and histology.

102. Advanced Bacteriology and Experimental Pathology. Either half-year. Undergraduate research problems. The STAFF

103. Anaerobic Bacteriology. (5) II. HALL

Lectures, W F, 9; laboratory, M W F, 10–12.

Prerequisites: course 101. Fee, $5; deposit, $5, subject to refund less deduction for breakage at end of half-year.

Historical; practical methods, anaerobes of the air, soil, and water and normal animal body; pathogenic anaerobes and the diseases caused by them.

104. General Pathology, Morbid Anatomy, and Histopathology. (6) II.
RUSK, ROSSON and Assistants

Tu W Th F, 2–5. Given at University Hospital, San Francisco.

Systematic discussion of changes in organs and tissues in the diseased human body; macroscopic lesions illustrated by fresh material from autopsies and museum preparations. The technique of autopsies, and the making of protocols is included. Histopathology is taught through the use of a loan collection and preparations from the autopsy materials demonstrated. Primarily for students in medicine.

105. Morbid Anatomy and Histopathology. (2) I.
Laboratory, Tu Th, 2–5. RUSK, ROSSON and Assistants

A continuation of course 104. An intensive study of the anatomy and histopathology of current autopsy material. Required of third-year medical students.

106. Clinical and Pathological Conferences. (1) I. F, 11. RUSK
Given at University Hospital, San Francisco.

A coöperative review of the clinical and pathological materials. For third- and fourth-year students in medicine and the clinical staff

Digitized by Google

GRADUATE COURSES

201. Research in Problems of Bacteriology, Infection, Immunity, and Experimental Pathology. Either half-year. The STAFF

202. Research in Neuropathology. Either half-year. RUSK
Given at University Hospital, San Francisco.

203. Advanced Morbid Anatomy and Histopathology. Either half-year. Given at University Hospital, San Francisco. RUSK and Assistants

Autopsy technique and the working up of tissues and cultures resulting from post-mortem examinations. Elective for fourth-year and graduate students in medicine.

Digitized by Google

PHILOSOPHY

CHARLES H. RIEBER, Ph.D., Professor of Logic.

GEORGE M. STRATTON, Ph.D., Professor of Psychology.

GEORGE P. ADAMS, Ph.D., Professor of Philosophy.

WARNER BROWN, Ph.D., Associate Professor of Psychology.

*CLARENCE I. LEWIS, Ph.D., Associate Professor of Philosophy.

JACOB LOEWENBERG, Ph.D., Assistant Professor of Philosophy.

OLGA L. BRIDGMAN, M.D., Ph.D., Assistant Clinical Professor of Abnormal Psychology.

EDWARD C. TOLMAN, Ph.D., Assistant Professor of Psychology.

STEPHEN C. PEPPER, Ph.D., Instructor in Philosophy.

PREPARATION FOR THE MAJOR

Required: 10–12 units chosen from courses 1A–1B (6 units), 2A (3), 3A–3B (6), 4A–4B (4). For students whose major work is primarily in psychology, courses in natural science may, with the consent of the department, be substituted for certain of the above courses.

Recommended: French and German.

Honors.—Candidates for the bachelor's degree with honors in philosophy will be expected to present programmes of study including courses in preparation for the major, and 24 units of upper division courses; all candidates to submit their programmes to the department for criticism and approval. It is possible for candidates for honors to arrange to do special work, in connection with the honors courses 198 and 199.

Courses in Other Departments.—Courses in social institutions (Teggart) will be accepted for all purposes of university credit as courses in the Department of Philosophy.

As part of the 24 units, required of candidates for honors in philosophy, students are urged to take courses in other departments according to their individual needs and interests. Attention is particularly called to courses dealing with the history of ideas and institutions, such as Economics 106, French 140A–140B, Greek 50, 51B, 61, 62, Jurisprudence 107A–107B, Political Science 101, Sanskrit 20, Semitic Languages 25.

LOWER DIVISION COURSES

Philosophy

1A. Deductive Logic. (3) I, M W F, 1; II, M W F, 2. RIEBER
Division, definition, the forms and transformations of judgments, the syllogism, and the deductive fallacies.

1B. Inductive Logic. (3) II. M W F, 1. RIEBER
The presuppositions and methods of inductive sciences.

*Absent on leave, 1920-21.

Digitized by Google

3A–3B. History of Philosophy. (3–3) Yr. M W F, 2. ADAMS

The history of ideas in Europe from the beginnings of philosophy in Greece to the present time. The development of reflective thinking upon the fundamental topics of life and reality, and its relation to science, the arts, religion, and social institutions.

First half-year: the period from 600 B.C. to the decline of Hellenistic culture, about 300 A. D.

Second half-year: the development of medieval ideas and institutions and of the modern world.

4A–4B. Introduction to Philosophy. (2–2) Yr. Tu Th, 10. LOEWENBERG

The aim and scope of philosophy. Relations to science and religion. Analysis of characteristic problems. Outlines and estimates of typical solutions.

36A–36B. Aesthetics. (2–2) Yr. Tu Th, 2. PEPPER

Prerequisite: sophomore standing.

Fundamental principles of the fine arts. Nature, origin, and development of the aesthetic experience.

*45A–45B. Philosophies of Social Relations. (2–2) Yr. Tu Th, 2. LEWIS

A critical survey of the philosophic basis of anarchism, individualism, socialism and communism. Fundamental ethical problems of political and economic organization. The points of view presented will be studied as they appear in the works of typical representatives —Stirner, Nietzsche, Tolstoi, Kropotkin, Hobbes, Hume, Rousseau, Marx, Sorel, and various contemporary writers.

Psychology

2A. General Psychology. (3) I. M W F, 3. STRATTON

The course is prerequisite to all other work in psychology: it is not open to freshmen; sophomores on completing it may elect course 102.

The facts of consciousness, their relation to one another and to the body. Demonstrations, lectures, and readings.

UPPER DIVISION COURSES

Philosophy

(Students enrolling in courses in this group should have completed at least six hours of work in the lower division courses, 1A, 1B, 3A–3B, 4A–4B.)

103C–103D. Philosophy of the Nineteenth Century. (3–3) Yr. M W F, 2.

I, Theoretical Tendencies. LOEWENBERG

II, Ethical and Religious Ideals. PEPPER

First half-year: Theoretic Tendencies and Ideas. General survey of some of the dominant theoretical tendencies of the nineteenth century, such as idealism, romanticism, materialism, positivism, evolutionism, naturalism.

Second half-year: Ethical and Religious Ideals. The conception of God and of the destiny of man in German idealism; the ethics of romanticism and of "self-realization", Comte and the "religion of humanity"; Feuerbach and the Tübingen school; English naturalism and agnosticism; and English utilitarianism.

The two halves of this course are supplementary; either may be taken independently.

* Not to be given, 1920–21.

Digitized by Google

104A–104B. Ethics. (3–3) Yr. M W F, 1. ADAMS

First half-year: The primary factors of human nature and their bearing upon moral values and ethical theories. Conflicting ethical ideals of the present time, and their historical and psychological origins.

Second half-year: An analysis and an estimate, in terms of moral value and of ethical theory, of the present economic and political structure of society, with reference to present practical problems.

105. The Kantian Philosophy. (3) I. M W F, 3. PEPPER

Prerequisite: course 3B or an equivalent knowledge.

An intensive study of the *Critique of Pure Reason,* and the *Foundation of the Metaphysics of Ethics,* with references to other philosophical works of Kant.

*109. Symbolic Logic. (3) II. M W F, 2. LEWIS

Graphic and symbolic methods in logic, and some applications. An introduction to modern logistic theory and practice.

111. Fundamental Theoretical Problems. (3) II. M W F, 3. LOEWENBERG.

A critical and constructive study of selected problems, particularly those touching the nature of knowledge and truth, the relation between will and reason, and the place of human selves in a world viewed as either rational or non-rational. The interpretation of these problems in the light of contemporary realism, pragmatism, and the philosophy of Bergson.

*112. Philosophy of Religion. (3) I. M W F, 3. ADAMS

A survey of present day theories of the nature of religion and its psychological and social origins. The relation between religion and modern ideals of life and society.

*114. Theory of Knowledge. (2) I. Tu Th, 9. RIEBER

Prerequisite: courses 1A, 1B.

An intensive study of the morphology of the concepts, the import of propositions, and the principles of inference.

*115. Logic of Science. (2) II. Tu Th, 9. RIEBER

Prerequisite: courses 1A, 1B.

The relation of the other sciences to mathematics and logic; the use of hypotheses in science; modern methods of verification and modern ideas about scientific truth.

116. Plato. (3) I. M W F, 2. RIEBER

The chief dialogues of Plato will be read in translation.

120A–120B. Philosophy of Nature. (2–2) Yr. M W, 11. PEPPER

Conceptions of the world we live in. Man's place in nature. The character, validity, and limits of natural science. Relations between natural law and human evaluations.

---

* Not to be given, 1920–21.

Digitized by Google

121A–121B. Philosophy of History. (2–2) Yr. Tu Th, 1. ADAMS

Selected problems in the analysis and interpretation of historical and social processes, such as the problem of method in the social sciences, the concept of "laws" of history, and the relation between economic, psychological and other factors in social evolution. A survey of contemporary theories of history and society.

*123. Post-Kantian Idealism. ——

Prerequisite: course 105.

Fichte, Schelling and Hegel: the development of the Kantian philosophy in Germany.

*135. Contemporary Tendencies in Philosophy. (2) II. ——

Exposition and criticism of current philosophical theories—naturalism, realism, pragmatism, and idealism. Some consideration of the influence of these several views in France, England, Germany, and America.

*139. Royce's Philosophy of the Community. (3) I. M W F, 2. LOEWENBERG

A detailed study of the nature of the self and of the social order as formulated in Josiah Royce's *The Philosophy of Loyalty, The Problem of Christianity, War and Insurance, The Hope of the Great Community,* and in other of his writings. The application of Royce's ethical ideas to current issues, national and international. The value of his doctrine of the community for science and religion.

146A–146B. Literary Expressions of Philosophic Problems. (2–2) Yr. Tu Th, 11. LOEWENBERG

An interpretation of literature as a source of philosophic ideas. Comparison between philosophic and literary expressions of typical problems. A detailed discussion of idealism, realism, mysticism, romanticism, classicism, and other human attitudes as reflected in literature and formulated in philosophy. Examples will be chosen from English literature as well as from Goethe, Tolstoi, Ibsen, Anatole France, and others. 146B will not be open to those who have not taken 146A.

198. Honors Course. The Staff in Philosophy

Psychology

Fees.—A fee of $5.00 each half-year will be charged in laboratory courses in psychology, i.e., courses 106, 107, 140A–140B, and 151A–151B.

Prerequisite.—Course 2A is prerequisite to all upper division courses in psychology.

102. Applied Psychology. (3) II. M W F, 3. STRATTON

Open to sophomores who have completed course 2A, which is also the prerequisite for upper division students who wish to take this course.

Certain results of modern psychology bearing upon the work of the lawyer, the physician, the teacher, the clergyman, and the merchant.

* Not to be given, 1920–21.

Digitized by Google

106. Introduction to Psychological Experiments. (3) I or II. BROWN
Tu Th and alternate S, 10–12.

Sensation, perception, emotion, movement, attention, memory, imagination, habit. Laboratory, lectures, and reading.

107. Introduction to Psychological Measurement. (3) I or II.
M W, 3–5, F, 3–4. TOLMAN, BROWN

Experiments illustrating methods of testing and measuring mental processes, particularly the methods in applied and clinical psychology.

110. Educational Psychology. (3) I. Tu Th and alternate S, 9.
One hour laboratory to be arranged. BROWN

The process of learning; the acquisition of habits and of skill; association; memory; imitation; reasoning; emotion; tendencies to action; individual differences.

*124A–124B. History of Psychology. STRATTON

Psychological observations, theory, and method, through early Hindu and Greek thought to the present time.

125. Advertising. (2) II. Tu, 7:30 P.M. BROWN
Prerequisite: course 2A and Economics 1A–1B.

The principles governing the choice of media, the choice of methods of appeal, the amount and nature of the matter, with emphasis upon experimental methods of measuring the effectiveness of advertising. The relation of advertising to marketing. Lectures, investigations, and criticism of advertisements.

133. Advanced General Psychology. (3) II. M W F, 9. TOLMAN
Prerequisite: course 2A and either 3A or 4A.

Contemporary discussions of sensation, perception, attention, the self, the will, mind and body, structuralism, functionalism, and behaviorism.

140A–140B. Psychological Experiments: Advanced. (3–3) Yr. BROWN
Not less than 6 hrs., throughout the year; 3 units.
Th, 1, and by appointment. Prerequisite: course 106 or 107.

Each student will conduct a special investigation, but all will work upon phases of a single problem. Experiments, reading, and discussion.

*141A–141B. Psychological Conference. STRATTON

Reading, with discussion, of selected topics in psychology.

142A–142B. Abnormal Psychology. Elementary. (2–2) Yr. Tu Th, 3.
BRIDGMAN

A study through lectures, reading, and clinical demonstration, of the more important phases of abnormality in children.

143A–143B. Abnormal Psychology. Advanced. (2–2) Yr. Tu Th, 2.
BRIDGMAN

Prerequisite: courses 106 or 107, and 142A–142B.

Special problems, with field work.

---

* Not to be given, 1920–21.

Digitized by Google

145A–145B. Social Psychology. (2–2) Yr. Th, 2–4. STRATTON

The instincts that create and endanger social life; their modification and interplay. Particular attention will be given to the manifestations of anger and pugnacity.

150. Animal Psychology. (3) I. M W F, 2. TOLMAN

Problems in the behavior and consciousness of animals: sensation, ideation, learning. Methods and results.

151A–151B. Experiments in Animal Behavior. (2–2) Yr. Tu, 1. TOLMAN

Prerequisite: course 150, unless taken concurrently.

Each student will conduct a special investigation on the sensations, instincts or learning of the higher vertebrates. Experiments, reading and discussion. Not less than 4 hours, to be arranged.

199A–199B. Honors Course. The Staff in Psychology

GRADUATE COURSES

Before enrolling in graduate courses students should consult the instructor concerning their qualifications.

210A–210B. Seminar in the History of Philosophy. (2–2) Yr. M, 4–6. LOEWENBERG

Topic for 1920–21: Studies in William James and Josiah Royce.

211A–211B. Seminar in Logic. (2–2) Yr. Th, 4–6. RIEBER

Topic for 1920–21: Personal idealism, with special reference to the philosophy of Howison.

212A–212B. Seminar in Ethics. (2–2) Yr. W, 4–6. ADAMS

Topic for 1920–21: The application of scientific method to the problem of value.

213A–213B. Psychological Research. (3–3) Yr. Tu, 4–6. The Staff in Psychology.

Not less than 6 hrs., throughout the year.

The investigation of special problems selected with regard to the individual interest of those electing the work; reports and discussions.

In addition to the foregoing courses, special lines of study will be arranged for qualified graduates who are candidates for higher degrees, or who wish to carry on advanced work.

299. Thesis for the Master's Degree.

Digitized by Google

PHYSICAL EDUCATION FOR MEN

FRANK L. KLEEBERGER, M.A., Professor of Physical Education and Director of Men's Gymnasium.

*WALTER E. MAGEE, Professor of Physical Culture.

EARL H. WIGHT, M.A., Instructor in Physical Education.

CLARENCE M. PRICE, B.S., Instructor in Physical Education.

C. S. BOTSFORD, Instructor in Physical Education.

CHARLES W. ANDREWS, Special Assistant in Wrestling.

R. E. JOHNSON, Special Assistant in Boxing.

PREPARATION FOR THE MAJOR

Required: Chemistry 1A (5); Zoology 1A (4); Hygiene 3 (3).

GENERAL ORGANIZATION

Plan of Prescribed Work.—Intrants are classified for their prescribed work on the basis of physical efficiency, determined through tests of health, strength, endurance, agility, ability to swim, and skill in self-defense. Men qualified for the athletic division may take regular work in any type of sport from golf to football. Men failing so to qualify, but not found defective in any essentials of health or bodily conformation, will meet for gymnastic drill during the first three weeks, and will be gradually assigned after medical examination and consultation with the director, to work adapted to their special needs. The aim of the department is to promote men as quickly as possible into the athletic division. Men showing abnormality of bodily conformation or physical defects of any sort are classed as "special" and are given individual work and advice based on the data of the medical and physical examinations. Ability to swim a distance of fifty yards is a department requirement which must be satisfied by all male students before receiving final credit for the required two units of physical education. The requirement in swimming may be waived where physical deficiency makes such procedure advisable. At the end of each college year tests will be held for those who wish to qualify for the honors-division.

Under the regulations any of the courses listed as lower division work may be taken in satisfaction of the University requirements of two units in physical education. The letters A and B for lower division courses denote the work as taken for credit during the two terms respectively, of the freshman year, while the letters C and D similarly represent the work done in the same courses when taken for sophomore credit. Two periods each week throughout the freshman and sophomore years and a satisfactory showing in the swimming test cover the requirement.

* Absent on leave, 1920–21.

Digitized by Google

Expenses of Students

The Gymnasium Fee of $2.00 is included in the gymnasium and infirmary fee of $5.00, payable by all students, undergraduate or graduate, at the beginning of each half-year of residence. The fee covers the expense entailed by the University in providing athletic equipment, tennis courts, swimming pool, shower baths and wash-room facilities for the use of students at various points about the campus. Locker accommodations are also provided for freshmen and sophomores; for upper classmen enrolled in the Department of Physical Education; for athletic teams and as far as possible for other students.

Gymnasium Suit Fee.—The amount of the gymnasium suit fee varies with the year of residence of the student concerned and covers the use, laundry, and repair of all types of gymnasium and athletic clothing with the exception of shoes, for the entire period of residence. For freshmen and sophomores the fee amounts to $4.00; for juniors who have not paid the gymnasium suit fee as freshmen or sophomores, $2.00, and for senior and graduate students who have not previously paid the fee, $1.00.

Fines.—A fine of $1.00 is imposed for each failure to comply with the regulations of the department as follows: (*a*) Failure to return equipment or clothing drawn from the gymnasium stockroom on or before the date posted for such return at the end of each half-year or at the end of each special session of the University. (*b*) Failure to return athletic supplies (balls, bats, etc.) within the twenty-four hour limit set for the use of such equipment. (*c*) Failure to comply with the directions issued for the use of lockers at the time of their assignment. (*d*) Failure to meet the appointment for the physical examination.

Lower Division Courses

Note.—All courses are offered either half-year.

1A, B, C, or D. Gymnastics. (½). Wight, Botsford
Sec. 1, M W, 10; Sec. 2, Tu Th, 10; Sec. 3, Tu Th, 11; Sec. 4, M W, 3; Sec. 5, Tu Th, 3; Sec. 6, M W, 4; Sec. 7; Tu Th, 4.

Athletic dancing and setting-up drills, apparatus and tumbling.

2A, B, C, or D. Special Gymnastics. (½). Kleeberger, Botsford
Sec. 1, M W, 2; Sec. 2, Tu Th, 2.

Corrective gymnastics; special attention is given to men with postural defects and adnormal conditions.

3A, B, C, or D. Track. (½). Price
Sec. 1, M W, 10; Sec. 2, Tu Th, 10; Sec. 3, M W, 3; Sec. 4, Tu Th, 3; Sec. 5, M W, 4; Sec. 6, Tu Th, 4.

Open to men enrolled on the Varsity or Freshman squads.

4A, B, C, or D. Baseball. (½). Price.
Sec. 1, M W, 3; Sec. 2, Tu Th, 3; Sec. 3, M W, 4; Sec. 4, Tu Th, 4; Sec. 5, M W, 5; Sec. 6, Tu Th, 5.

Instruction in the elements of individual and team play and participation in informal games. Special games arranged for competition on Fridays and Saturday mornings.

Digitized by Google

5A, B, C, or D. Basketball. (½). WIGHT, PRICE.
Sec. 1, M W, 9; Sec. 2, Tu Th, 9; Sec. 3, M W, 10; Sec. 4, Tu Th, 10; Sec. 5, M W, 11; Sec. 6, Tu Th, 11; Sec. 7, M W, 3; Sec. 8, Tu Th, 3; Sec. 9, M W, 4; Sec. 10, Tu Th, 4.

Instruction in the elements of individual and team play and participation in informal games. Special games arranged for competition on Fridays and Saturday mornings. Sections limited to twenty men each.

6A, B, C, or D. Tennis. (½). KLEEBERGER
Sec. 1, M W, 8; Sec. 2, Tu Th, 8; Sec. 3, M W, 9; Sec. 4, Tu Th, 9; Sec. 5, M W, 10; Sec. 6, Tu Th, 10; Sec. 7, M W, 11; Sec. 8, Tu Th, 11.

Instruction in the elements of individual and team play and participation in informal games. Special games arranged for competition on Fridays and Saturday mornings. Games and tournaments under supervision.

7A, B, C, or D. Boxing. (½). JOHNSON
Sec. 1, M W, 8; Sec. 2, Tu Th, 8; Sec. 3, M W, 9; Sec. 4, Tu Th, 9; Sec. 5, M W, 10; Sec. 6, Tu Th, 10; Sec. 7, M W, 11; Sec. 8, Tu Th, 11; Sec. 9, M W, 2; Sec. 10, Tu Th, 2; Sec. 11, M W, 3; Sec. 12, Tu Th, 3; Sec. 13, M W, 4; Sec. 14, Tu Th, 4.

Principles of position, balance, footwork and blows.

8A, B, C, or D. Wrestling. (½). ANDREWS
Sec. 1, Tu Th, 8; Sec. 2, M W, 9; Sec. 3, Tu Th, 9; Sec. 4, M W, 10; Sec. 5, Tu Th, 10; Sec. 6, Tu Th, 11; Sec. 7, M W, 2; Sec. 8, Tu Th, 2; Sec. 9, M W, 3; Sec. 10, Tu Th, 3; Sec. 11, M W, 4; Sec. 12, Tu Th, 4.

Preparatory exercises for special development the various holds, their counters and the general theory of weight control.

9A, B, C, or D. Fencing. (½). KLEEBERGER
Sec. 1, M W, 1; Sec. 2, Tu Th, 1.

Class exercise with the single stick, broad-sword, foil, and bayonet, followed by practice in personal combat.

10A, B, C, or D. Swimming. (½). KLEEBERGER
Sec. 1, M W, 2–2:30; Sec. 2, Tu Th, 2–2:30; Sec. 3, M W, 2:30–3; Sec. 4, Tu Th, 2:30–3; Sec. 5, M W, 3–3:30; Sec. 6, Tu Th, 3–3:30.

Personal and class instruction in the various strokes. Demonstrations and practice in methods of rescue and resuscitation. Instruction in the art of diving.

12A, B, C, or D. Soccer. (½). PRICE

Instruction in the elements of individual and team play and participation in informal games. Special games arranged for competition on Fridays and Saturday mornings.

13A, B, C, or D. Football. (½). PRICE
Sec. 1, Rugby; Sec. 2, American.

Open to men enrolled on the varsity or freshman squads.

14A, B, C, or D. Class Games. (½). BOTSFORD

Playground baseball, volleyball, field hockey and mass athletics.

Digitized by Google

15A, B, C, or D. Handball. (½). BOTSFORD

16A, B, C, or D. Recreation. (½). BOTSFORD
Cross-country walking, horseback riding, golf, bag punching, etc.

17A, B, C, or D. Tumbling. (½). BOTSFORD
Sec. 1, M W, 4; Sec. 2, Tu Th, 4.
Elementary tumbling and apparatus work.

18A, B, C, or D. Crew. (½). KLEEBERGER
Open to men enrolled on the varsity or freshman squads.

UPPER DIVISION COURSES

110A. Physiology and Hygiene of Exercise. (2) II. Tu Th, 1. KLEEBERGER
Prerequisite: Physiology 1.
Physiology in its interpretation of the phenomena resulting from exercise. The influence of various types of exercise upon the nutrition, circulation, respiration and nervous functioning. A discussion of the hygienic significance of diet, ventilation, exercise, personal habits, etc. The physiological bearing of hydrotherapy, balneotherapy, electrotherapy, and massage, in the treatment of scar tissue, ankylosed joints, inflammations, and athletic injuries.

101A. Construction and Administration of Playgrounds, Swimming Pools and Gymnasia. (1)I. F, 3.
The development and meaning of the playground movement. Recreational surveys and promotion. Adaptation of various types of physical recreation to community needs. Leisure time activities for adults. Administration and supervision of school and municipal playgrounds. Qualifications and duties of directors. Playground and gymnasia construction. Problems of equipment and general maintenance.

122A. Athletic Supervision. (1) II. Th, 1. WIGHT
Consideration of the problems involved in organization and administration of athletics for various types of institutions such as schools, athletic clubs, industrial plants, etc. The promotion of tournaments, athletic meets, leagues, etc. The problem of mass vs. specialized athletics. The promotion of intra-mural sports and of participation in unorganized recreative sports. Educational analysis and ideals.

300A. Methods and Practice in Teaching Playground Activities. (1) II. F, 3. BOTSFORD
Discussion and practical experience with reference to the organization and direction of playground activities, athletic, dramatic, social and educational for child and adult. The technique of group, team and individual games. Organization and conduct of leagues, meets, pageants and the daily routine of work. This course is conducted as a field course and actual participation in the playground activities is demanded if credit is desired.

Digitized by Google

301A, B, C, or D. Methods and Practice in Coaching Athletics. (1–1).
KLEEBERGER and the STAFF

Prerequisite: courses 122A, 3, 4, 5, 7, 8, 10, 12, 13, and 17.

Students will enroll on the varsity squads of not less than two different sports each half-year with the exception of the half-year devoted to football. Repetition of a sport for credit will not be permitted. The sports to be covered are American football, baseball, basketball, track, soccer, Rugby, swimming, boxing, wrestling and gymnastics. Men enrolled in this course will meet in conference each week with the coach for discussion of the theoretical phases of the sport and explanation of methods used in coaching, training and planning season campaigns. Written examinations will be required as well as a demonstration of ability to coach and perform in the sports taken during a given half-year. 2 hrs., each half-year of the junior and senior years.

Digitized by Google

PHYSICAL EDUCATION FOR WOMEN

RUTH ELLIOTT, A.B., Assistant Professor of Physical Education.
SARAH R. DAVIS, Assistant Professor of Physical Education.
CAROLINE COLEMAN, A.B., Associate in Physical Education.
FRANCES BOCKIUS, A.B., Associate in Physical Education.
JOSEPHINE GUION, A.B., Associate in Physical Education.
VIOLET MARSHALL, Associate in Physical Education.
—— ——, Associate in Physical Education.
EDITH UELAND, M.A., Assistant in Physical Education.

For information concerning the major in Physical Education and the requirements for the High School Teacher's Recommendation see the Announcement of the School of Education.

LOWER DIVISION COURSES

52A–52B. Prescribed Course for Freshmen. (½–½) Yr.

Required of all undergraduate women not enrolled in courses 53A-53B or 54A–54B during the first year of their attendance at the University.

Sec. 1, Tu Th, 9; Sec. 2, Tu Th, 10; Sec. 3, Th S, 10; Sec. 4, Tu S, 11; Sec. 5, Tu Th, 3; Sec. 6, Tu Th, 3; Sec. 7, M F, 9; Sec. 8, M W, 9; Sec. 9, M W, 10; Sec. 10, M F, 10; Sec. 11, M W, 11; Sec. 12, M W, 2; Sec. 13, M F, 2; Sec. 14, — —, (for students entering in January, 1921); 52A, Sec. 15, M W, 9; Sec. 16, M W, 3; Sec. 17, Tu Th, 4 (for students who entered in January, 1920); 52B, Sec. 15, Tu S, 9; Sec. 16, M W, 11; Sec. 17, Tu Th, 4.

52C–52D. Prescribed Course for Sophomores. (½–½) Yr.

Required of all undergraduate women not enrolled in courses 53C-53D or 54C–54D during the second year of their attendance at the University. Prerequisite: course 52A–52B.

Sec. 1, Tu Th, 9; Sec. 2, Tu S, 10; Sec. 3, Tu Th, 2; Sec. 4, W F, 9; Sec. 5, M W, 10; Sec. 6, W F, 2; Sec. 7, M F, 3; Sec. 8, Th S, 9; Sec. 9, W F, 10; Sec. 10, W F, 3; 52D, Sec. 11, Tu Th, 4; Sec. 12, M W, 9.

53A–53B. Corrective Gymnastics. (½–½) Yr.

Required instead of course 52A–52B of first-year students whose medical and physical examinations indicate the need of corrective exercises.

Sec. 1, Tu Th, 9; Sec. 2, Tu Th, 10; Sec. 3, Tu Th, 2; Sec. 4, M W, 9; Sec. 5, M W, 10; Sec. 6, M W, 2.

53C–53D. Corrective Gymnastics. (½–½) Yr.

Required instead of course 52C–52D of second-year students whose medical and physical examinations indicate the need of corrective exercises. Prerequisite: course 53A–53B.

Sec. 1, Tu Th, 11; Sec. 2, M W, 11.

Digitized by Google

54A–54B. Restricted Exercise. (½–½) Yr. Tu Th, 2.

Required instead of course 52A–52B of first-year students whose medical and physical examinations indicate the need of restricted work.

54C–54D. Restricted Exercise. (½–½) Yr. Tu Th, 10.
Prerequisite: course 54A–54B.

Required instead of course 52C–52D of second-year students whose medical and physical examinations indicate the need of restricted work.

55A–55B. Corrective Gymnastics. (½–½) Yr.
Prerequisite: courses 53A–53B, 53C–53D.

60A–60B. Folk Dancing. (½–½) Yr. Tu Th, 11.
Prerequisite: courses 52A–52B, 52C–52D. Open to juniors and seniors.

60C–60D. Folk Dancing. (½–½) Yr. M W, 3.
Prerequisite: course 60A–60B.

61A–61B. Classic Dancing. (½–½) Yr. M W, 2.
Prerequisite: courses 52A–52B, 52C–52D. Open to juniors and seniors.

61C–61D. Classic Dancing. (½–½) Yr. Tu Th, 3.
Prerequisite: course 61A–61B.

64. Dancing: Partheneia Practice. (No credit.) II.
Prerequisite: for freshmen, enrollment in course 52A–52B; for students other than freshmen, one course in dancing in the department.

65A–65B. Gymnastics for Juniors. (½–½) Yr. M W, 11.
Prerequisite: courses 52A–52B, 52C–52D.

65C–65D. Gymnastics for Seniors. (½–½) Yr. Tu Th, 11.
Prerequisite: course 65A–65B.

66A–66B. Gymnastics for Graduate Students. (½–½) Yr. Tu Th, 11.
Prerequisite: courses 65A–65B, 65C–65D.

74A–74B. Swimming. (No credit.) Yr.

Sec. 1, advanced; Sec. 2, intermediate; Sec. 3, elementary.

84A–84B. General Recreative Course. (No credit.) Yr. Tu Th, 5.

Open with the consent of the instructor to students not taking other work in the department and to women of the faculty, also to women employees of the University.

Upper Division Courses

151. Kinesiology. (3) I. M W F, 1.
Prerequisite: Anatomy 102.

152. Theory and Practice of Corrective Gymnastics. (2) II.
M W, 1, and 1 other hour. Prerequisite: course 151.

153A–153B. Practice of Corrective Gymnastics. (1–1) Yr. S, 9–12.
Prerequisite: course 152.

Digitized by Google

155. Theory and Practice of Massage. (1) II. F, 1–3.
Prerequisite: courses 151–152.

160A–160B. Theory and Practice of Teaching Folk Dancing. (1–1) Yr. F, 8. Prerequisite: course 60A–60B.

161A–161B. Theory and Practice of Teaching Classic Dancing. (1–1) Yr. W, 1. Prerequisite: course 61A–61B.

162. Theory and Practice of Rhythmic Plays, Games, and Story Plays. (2) I. M W, 8.

165A–165B. Theory and Practice of Gymnastic Teaching. (2–2) Yr. Tu Th, 8. Prerequisite: courses 65A–65B, 151, and consent of the instructor.

170. Theories of Play, School, and Playground Games. (2) II. M W, 8.

171A–171B. Theory and Practice of Athletic Supervision. (1–1) Yr. Th, 1. Prerequisite: a working knowledge of at least two team games.

175. Theory and History of Physical Education and Recreation. (3) II. M W F, 3. Prerequisite: courses 160A, 170, 165A.

Graduate Courses

250. Seminar. II.
Prerequisite: course 175.

Topic for the year 1920–21: Current Tendencies in Physical Education.

300. Teaching of Physical Education.
Prerequisite: course 165A–165B. Recommended in connection with Education 320.

Digitized by Google

PHYSICS

E. Percival Lewis, Ph.D., Professor of Physics.

Frederick Slate, B.S., Professor of Physics, Emeritus.

Elmer E. Hall, Ph.D., Professor of Physics.

Ralph S. Minor, Ph.D., Professor of Physics.

William J. Raymond, B.S., Associate Professor of Physics.

Lloyd T. Jones, Ph.D., Assistant Professor of Physics.

Raymond T. Birge, Ph.D., Assistant Professor of Physics.

William H. Williams, Graduate, United States Military Academy, Instructor in Physics.

Elmer Dershem, Ph.D., Instructor in Physics.

Raymond B. Abbott, Ph.D., Associate in Physics.

William C. Pomeroy, M.S., Associate in Physics.

William R. Stamper, Mechanician.

Fourteen assistants.

The work in physics is carried on in South Hall. The equipment of the laboratories and research rooms with apparatus is modern and extensive including many standards of precision. The equipment is being continually supplemented by purchase from manufacturers and by original construction in the work-shop of the department where three competent instrument makers are employed. The library facilities for original investigation in physics are unusually ample. The University Library contains complete sets of all of the important physical journals, and the proceedings and transactions of most of the academies and other societies.

As a basis for admission to college work in physics the student should present either (1) the high school course in physics, or (2) three years of high school mathematics, including trigonometry, and high school chemistry. Courses 1A–1B to 4A–4B are fundamental and designed to meet the needs of students preparing for applications of physics in the Colleges of Engineering, Chemistry, and Medicine, or for advanced work in the subject itself.

Preparation for the Major

Required: Physics 1A–1B, 4A–4B (12), or 2A–2B, 3C–3D (10); Mathematics 3A–3B (6), or 5, 9 (6); Chemistry 1A–1B (10).

Recommended: French or German.

No special courses are given for honors-students. Provision is made for instruction of a special character in the cases of individuals who seem prepared and inclined to profit by it. See course 119A–119B.

No special requirements, in addition to those prescribed by the Graduate Division, are laid down for the Master's degree or for the degree of Doctor of Philosophy, except that in general an experimental thesis will be required.

Digitized by Google

Laboratory Fees.—The deposit for all laboratory courses is at the rate of $5 per half-year for each laboratory exercise a week, but no deposit or fee is required for research courses 216, 218, and 299. The fees are: 3A, 3B, 3C, 3D, 4A, 4B, 18, $4 per laboratory unit per half-year; for course 115A-115B, $5, and for other courses $3 per laboratory unit per half-year.

Lower Division Courses

Prerequisite for all lower division courses: either (1) the high school course in physics, or (2) three years of high school mathematics, including trigonometry, and the high school course in chemistry.

Course 2A–2B is prerequisite to courses 111A, 112A, 113.

1A–1B. General Physics. (3–3) Yr. (For students in Engineering, Chemistry, and Architecture only.) Minor, Birge, Pomeroy
Lectures: Sec. 1, M F, 1; Sec. 2, Tu Th, 1; Sec. 3, Tu Th, 3. Twenty-one recitation sections.

Mechanics, properties of matter, and heat. Two lectures and one recitation each week.

2A–2B. General Physics. (3–3) Yr. (Primarily for non-engineering students.) Lewis, Minor
Lectures: Sec. 1, M W F, 3; Sec. 2, M W F 9. Sec. 1 elective in the College of Letters and Science. Sec. 2, for premedical students. Prerequisite may be waived in cases of distinct merit.

Lectures with experimental illustration and problems. Properties of matter, mechanics, heat, sound, light, electricity and magnetism.

3A–3B. Physical Measurements. (1–1) Yr. Minor, Dershem
Sec. 1, M, 1–4; Sec. 2, Tu, 1–4; Sec. 3, Th, 1–4; Sec. 4, F, 1–4. For students in the pre-medical curriculum.

Experimental work in mechanics, properties of matter, heat, sound, light, electricity and magnetism, requiring quantitative results. Laboratory exercises once a week, usually taken in conjunction with 2A–2B.

3C–3D. Physical Measurements. (2–2) Yr. Minor, Dershem
Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4. Subject matter identical with course 3A–3B.

4A–4B. General Physics. (3–3) Yr. (Primarily for students in the Colleges of Engineering.) Hall, Jones, Abbott
Lectures: Sec. 1, Tu Th, 8; Sec. 2, Tu Th, 10; Sec. 3, W, 1, S, 8; laboratory: Sec. 1, M, 8–11; Sec. 2, M, 1–4; Sec. 3, Tu, 9–12; Sec. 4, Tu, 1–4; Sec. 5, W, 8–11; Sec. 6, W, 1–4; Sec. 7, Th, 9–12; Sec. 8, Th, 1–4; Sec. 9, F, 8–11; Sec. 10, F, 1–4; Sec. 11, S, 9–12.

Magnetism, electricity, wave motion, sound and light, presented as a continuation of 1A–1B. Two lectures and one laboratory exercise each week.

18A–18B. Special Undergraduate Study. Minor

All special work of lower division grade. Credit value to be fixed in each case. By special arrangement this course may be made the equivalent of parts of the regular work of courses 1A–1B, 3C–3D, 4A–4B.

Digitized by Google

Upper Division Courses

Students who plan to enter any of the courses assigned to "The Staff" are directed to confer with the chairman of the department before enrolling. Courses 118A–118B, 119A–119B, 219A–219B are laid out by special agreement and are designed to introduce students to advanced topics in preparation for the systematic study which is the aim of the upper division and graduate work.

104A–104B. Vector Analysis. (2–2) Yr. M F, 8. WILLIAMS

The elements of vector analysis with special emphasis upon its application to physics. This course is intended to serve as a general introduction to theoretical physics, wherein the fundamental equations are developed and discussed by means of the concise and physically significant algebra of vectors.

105A–105B. Analytic Mechanics. (3–3) Yr. M W F, 9. RAYMOND

Prerequisite: the high school course in physics and working power in the differential and integral calculus.

The mathematical treatment of principles of dynamics that are fundamental, illustrated by problems and applications.

106. History of Physics. (2) II. M W, 11. CAJORI

Development of the experimental method; evolution of laboratories; critical periods in the history of hypotheses. A course designed more especially for teachers. Identical with Mathematics 106.

107A–107B. Electrical Measurements. (3–3) Yr. RAYMOND

I, Lect., Tu Th, 10; lab.: Sec. 1, Tu; Sec. 2, W; Sec. 3, F, 1–4.

II, Lect., Th, 10; lab.: Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4; Sec. 3, W, 1–4, S, 9–12. Prerequisite: course 4A–4B and the differential and integral calculus.

The principles of electricity and magnetism, with applications to the measurement of magnetic field, direct and alternating electric current, electro-motive force, resistance, power, illumination, magnetic permeability and the energy losses in iron, electric capacity, inductance and impedance. Calibration and use of the more important types of measuring instruments.

108A. Physical Optics. (2) I. Tu Th, 9. MINOR

Prerequisite: courses 2A–2B and Mathematics 9.

Lectures, with experimental illustrations and recitations, on selected topics in light.

108B. Polarized Light. (2) II. Tu Th, 1–4. MINOR

Prerequisite: courses 2A–2B, 3C–3D, or their equivalents.

Laboratory work, with occasional lecture. Methods of producing and detecting plane, circularly, and elliptically polarized light. Practical applications in crystallography, saccharimetry, and metallic reflection. Optical activity.

110A–110B. Electricity. (2–2) Yr. Tu Th, 8. JONES

Prerequisite: the equivalent of course 2A–2B and working power in differential and integral calculus.

Elementary mathematical theory of electricity and magnetism.

Digitized by Google

111A. Electric Discharge Through Gases. (2) I. M F, 9. LEWIS

Lectures, experimentally illustrated, on phenomena of the flame and electric arc, spark, and vacuum tube: and on cathode rays, X-rays, and radio-activity. This course is recommended as preliminary to course 211.

*112A. Energetics. (2) II. Tu Th, 10. HALL

A non-mathematical account of forms and transformations of energy.

112B. Pyrometry and Heat Measurements. (2) I. Tu Th, 1–4. HALL

Selected problems in pyrometry and heat measurements adapted to students in physics, chemistry and engineering. Laboratory work with readings and discussions.

*113. Geometrical Optics. (2) II. Tu Th 9. MINOR

Geometrical methods applied to the optics of mirrors, prisms, and lenses.

*114. Sound. (2) II. RAYMOND

Prerequisite: the equivalent of course 2A–2B and working power in differential and integral calculus.

Laboratory work with occasional lectures and discussions. An experimental treatment of sound sources, and of progressive and stationary waves of sound.

115A–115B. Laboratory Technique. (1–1) Yr. Th, 1–4. JONES

General ideas underlying the construction and adaptation of apparatus for research. Adjustments and laboratory technique, including glass blowing.

116A–116B. Thermionic Measurements. (1–1) Yr. ABBOTT

Prerequisite: course 107A–107B or equivalent.

Laboratory measurements of vacuum tube characteristics, wave forms and wave lengths.

118A–118B. Special Undergraduate Study (Laboratory). Yr. The STAFF

All special laboratory work of upper division grade not included in courses announced above. Credit value to be fixed in each case.

119A–119B. Special Undergraduate Study (Readings). Yr. The STAFF

Selected topics for reading, intended primarily for honors students.

GRADUATE COURSES

*205A–205B. Advanced Dynamics. (3–3) Yr. M W F, 1. WILLIAMS

Prerequisite: 105A–105B or its equivalent.

The generalized dynamical methods of Lagrange, Hamilton and Jacobi and their application to selected problems in the mechanics of particles and of rigid bodies; together with an introduction to the theory of elasticity and hydrodynamics.

* Not to be given, 1920–21.

Digitized by Google

206A–206B. Harmonic Motion, Electric Waves and Oscillations. (2–2) Yr. Tu Th, 8. RAYMOND

Prerequisite: courses 2A–2B and 105A–105B or equivalents.

The analytical treatment of vibratory and wave motion, with applications to sound, light, and electricity. Lectures with experimental illustrations.

207A–207B. Thermionic Conduction. (2–2) Yr. M W, 9. ABBOTT

Mathematical theory of thermionic emission, conduction and regenerative oscillations in vacuum tubes with applications to radio communication and laboratory work.

210A–210B. Electron Theory. (3–3) Yr. M W F, 1. WILLIAMS

Prerequisite: some knowledge of elementary electromagnetic theory and familiarity with vector analysis.

The electron theory of matter and its application to the more important phenomena of radiation and to the electric, magnetic and thermal properties of bodies.

211. Spectroscopy. (2) II. M F, 9. LEWIS

Prerequisite: course 108A. Course 111A will also be found helpful.

Lectures with experimental illustrations, on methods and results of investigation, and theories of radiation and atomic structure.

212. Thermodynamics. (2) I. M W, 11. HALL

Largely the so-called classical treatment. The two fundamental laws, entropy, and potential with application to various problems in physics, including radiation.

213. Kinetic Theory of Matter. (3) II. M W F, 9. HALL

Fundamental ideas and assumptions, Maxwell's law, viscosity, diffusion, heat conductivity. Relation of kinetic theory to thermodynamics.

214A–214B. X-Ray and Crystal Structure. (2–2). Yr. DERSHEM

Experimental lectures and discussions. A study of X-rays, crystal forms, and space lattices with applications to X-ray spectroscopy. Designed especially to familiarize the student with the apparatus and experimental methods used in X-ray research.

215A–215B. Radiation and Atomic Structure. (2–2) Yr. M F, 8. BIPGE

Prerequisite: course 211 or its equivalent.

A discussion of recent work in the fields of electric discharge through gases, spectroscopy, X-rays, and magneto-optics bearing upon the general problem of atomic structure.

216A–216B. Special Advanced Study and Research. Yr. The STAFF

Research course in connection with the thesis for the degree of Doctor of Philosophy.

218A–218B. Graduate Laboratory Work. Research. Yr. The STAFF

219A–219B. Graduate Seminar. Yr. The STAFF

Selected topics, varied from year to year.

Digitized by Google

220A. Seminar. Theory of Relativity. I. WILLIAMS

The science of kinematics based on Einstein's principles of equivalence and the resulting law of gravitation.

220B. Seminar. Quantum Theory. II. WILLIAMS

Planck's quantum hypothesis and its application to the statistical mechanics of radiation. Recent extensions and developments of the theory with particular reference to spectral line phenomena.

299A–299B. Thesis for the Master's Degree. The STAFF

300. Teachers' Course. (3) II. Tu Th S, 9. MINOR

A seminar designed for prospective teachers of physics.

Digitized by Google

PHYSIOLOGY

ROBERT GESELL, M.D., Professor of Physiology.
SAMUEL S. MAXWELL, Ph.D., Associate Professor of Physiology.
THEODORE C. BURNETT, M.D., Assistant Professor of Physiology.
ROSALIND WULZEN, Ph.D., Instructor in Physiology.
LILLIAN M. MOORE, Ph.D., Instructor in Physiology.
ANITA D. LATON, A.B., Assistant in Physiology.
ROBERT THACKWELL TROTTER, A.B., Assistant in Physiology.
EDWARD WHITTIER BLAIR, A.B., Assistant in Physiology.
——— ———, Associate in Physiology.

PREPARATION FOR THE MAJOR

Required: Zoology 1A–1B (10) or Physiology 1 (5), 2 (4), Physics 2A–2B (6), 3C–3D (4), Chemistry 1A–1B (10), 8, 9 (6).

Recommended: German, French, Physical Chemistry, Histology and Neurology.

LOWER DIVISION COURSES

1. Introductory Human Physiology. (5) I. Lect., Tu Th S, 11; lab. Sec. 1, Tu Th, 2–5; Sec. 2, M F, 2–5. MAXWELL, WULZEN, LATON
Prerequisite: Chemistry 1A–1B. Deposit, $5.

2. Introductory General Physiology. (4) II. Lect., Tu Th, 10, and 1 quiz hour; lab.: Sec. 1, Tu Th, 2–4; Sec. 2, M W, 2–4. MAXWELL, LATON
Prerequisite: Chemistry 1A, 1B. Deposit, $5.

3. Physiology of Infancy. (2) II. Tu Th, 11. WULZEN

UPPER DIVISION COURSES

101. Principles of General and Mammalian Physiology. (5) II. GESELL, BURNETT, MOORE, BLAIR
Lectures, demonstrations and conferences. M Tu W Th, 11, and F, 10.
Prerequisite: Zoology 1A–1B or Physiology 1–2, Physics 2A–2B, 3A–3B, Chemistry 1A–1B, 8, 9. Recommended: German, French, Physical Chemistry, Histology, and Neurology.

102. Principles of General and Mammalian Physiology. (3 or 5) II. GESELL, BURNETT, MOORE, TROTTER
Laboratory and conferences: M Tu W Th, 8–11; F, 8. 3 or 5 units of laboratory work may be taken along with or following Physiology 101. Prerequisite: same as for Physiology 101. A deposit of $15 is required of academic students; after deductions for breakage or loss $5 may be returned. For fees charged medical students see the Announcement of the Medical School.

103A–103B. Special Problems (credit to be arranged). Yr. The STAFF
Prerequisite: Physiology 101 and 102.

GRADUATE COURSES

201A–201B. Research (credit to be arranged). Yr. The STAFF

202A–202B. Journal Club and Seminar. (No credit). Yr. The STAFF

Digitized by Google

POLITICAL SCIENCE

DAVID P. BARROWS, Ph.D., LL.D., President of the University and Professor of Political Science.

BERNARD MOSES, Ph.D., LL.D., Professor of History and Political Science, Emeritus.

EDWARD ELLIOTT, Ph.D., Professor of International Law and Politics.

THOMAS H. REED, A.B., LL.B., Professor of Municipal Government.

[1]EDGAR DAWSON, Ph.D., Professor of American Government.

E. M. SAIT, Ph.D., Professor of Political Science.

J. R. DOUGLAS, Ph.D., Assistant Professor of American Politics and Administration and Director of the Bureau of Public Administration.

Seven teaching fellows.

PREPARATION FOR THE MAJOR

Required: Political Science 1A–1B (6) or 5 (as given in 1918–19).

Honors.—The department will recommend students for honors at graduation on the basis of 24 units of work under its control passed with first and second grades. The bulk of it must be chosen from upper division courses in political science. Each applicant's plan of studies will be considered on its merits. The programme should be prepared, as completely as possible, at the beginning of the junior year, in consultation with the member of the department designated as supervisor of honors students.

Course 199 is open, by special permission, to students seeking honors, or other qualified students. The course consists primarily of extensive reading in politics and examination of actual government. Freedom of choice and effort is encouraged. A maximum credit of 4 units a half-year is offered. In addition, candidates for honors may, and preferably should, take in their senior year Political Science 201A–201B.

The department will test from time to time the fitness of honors students to continue their candidacy.

The final test of the fitness of the candidate for honors at graduation takes the form of an oral examination in the last half of the senior year. Written work of each applicant, prepared at any time during the college course, is reviewed and the general knowledge of government, American and foreign (including local government), international relations, and political theory, is tested.

LOWER DIVISION COURSES

A knowledge of American government, equivalent to that provided by a high school course in civics, is a prerequisite to courses 1A and 1B. This will be tested by examination early in the session.

1A. Government. (3) I. M W F, 3. REED
Book and syllabus fee, fifty cents.

The government and parties of Great Britain, her self-governing dominions, and the United States.

[1] To December 31, 1920.

Digitized by Google

1B. Government. (3) II. M W F, 3. REED

This course is prerequisite to all upper division courses in the department. Book and syllabus fee, fifty cents.

The government and parties of Continental Europe.

UPPER DIVISION COURSES

101. Theory of the State. (2) I. M W, 2. ELLIOTT

An introductory study of the fundamentals of politics.

102. American Political Institutions. (2) II. M W, 2. ELLIOTT

A study of the origin and development of political institutions in the United States. Recommended for students whose major is political science and for students who intend to teach government in high schools.

108. American Government. (3) I. M W F, 10. DOUGLAS

An examination of the formation and development of the American constitutional system; English and colonial origins; the establishment of the Constitution; development by legal interpretation and political practice.

109. Political Parties in the United States, England and France. (3) I. M W F, 3. SAIT

Party history and organization; nominations; elections; the play of party upon executive and legislative organs.

110A. The Government of Cities. (3) I. M W F, 1. REED

The development and present status of the governmental organization and activities of German, French, British and American cities.

110B. Municipal Administration. (3) II. M W F, 1. REED

The principles and methods by which cities perform their functions, especially in the United States.

112. State Government. (3) II. M W F, 10. DOUGLAS

A survey of the constitutional development and governmental organization of the American states, with special reference to California.

115. Principles of Public Administration. (2) I. Tu Th, 2. DOUGLAS

The development of public administration, especially in the United States; the organization of administrative departments, and the methods by which administrative action is reviewed and controlled.

123. Government of France. (3) II. M W F, 2. SAIT

A survey of the working political institutions of today.

124. Government of England. (3) I. M W F, 2. SAIT

A survey of the working political institutions of today.

Digitized by Google

125. English Government and Parties in their Development Since 1832. (3) II. M W F, 3. SAIT

A study of the political conflicts and adjustments which have given shape to the existing constitutional system.

199A–199B. Honors Course. Yr. The STAFF

351. Government in the Secondary School. (2) I. M W, 11. DAWSON

A course for prospective teachers of civics, dealing with the elementary principles of democratic government and the most generally accepted methods of teaching these principles to pupils of high school age. While the history and theory of instruction in civics will be presented, the purpose of the course is practical and it is organized to meet the growing demand for trained teachers in this field.

GRADUATE COURSES

The scope of instruction covers modern governments (including administration, state, local, and municipal government), political theories, internal politics, international relations. Candidates for the doctor's degree who offer political science as a major subject are also expected to take courses in the department of jurisprudence in the Constitutional Law of the United States and in International Law, with study of leading cases.

Candidates for the master's degree must complete a course of studies approved by the department embracing at least 18 units of graduate and upper division work, in addition to presenting an acceptable thesis (course 299). They must, furthermore, pass a final oral examination.

The University Library is equipped for the study of government and politics of the United States, of Spanish America, and of central and western Europe. Its collections are being added to, for the study of the Far East and the Pacific, as well as eastern and southeastern Europe. The Bancroft Library contains extensive materials (which are constantly being increased) for the study of the institutions and politics of Spanish North America.

201A. Reading Course in Political Writings. (3) I. M W, 8:30–10. ELLIOTT

A reading course in political writings; Plato's Republic; Aristotle's Politics; Machiavelli's Prince; Hobbes' Leviathan; Locke's Essays on Government; Montesquieu's Spirit of the Laws; Rousseau's Social Contact.

201B. Continuation of 201A. (3) II. M W, 8:30–10. ELLIOTT

The reaction against the doctrines of the eighteenth century, as represented by the writings of De Maistre and Burke; Godwin's Political Justice; Bentham's A Fragment on Government, and Principles of Morals and Legislation; Austin's Province of Jurisprudence; Mill's Essays on Liberty and Representative Government; the social and political doctrines of August Comte; Bagehot's Physics and Politics; exponents of scientific anarchism and of state socialism; modern writers, chosen according to preference of the class.

Digitized by Google

205A–205B. Seminar in Administration. (2–2) Yr. Tu, 4–6. DOUGLAS

Special studies in problems of federal, state and local administration.

208A–208B. Municipal Government. (2–2) Yr. M, 4–6. REED

Investigation of actual problems of municipal government with special reference to administration.

Note.—Courses 205 and 208 may be repeated without duplication of credit.

211A–211B. Seminar in Western European Politics. (2–2) Yr. W, 4–6. SAIT

In the first semester attention will be called to the political situation in England during the years 1906–1914; in the second, to the recent phases of the socialist and syndicalist movements in European countries.

251. Instruction in Government. (2) I. Tu, 7:30–9:30 P.M. DAWSON

This seminar will examine the present tendencies in the teaching of government in the light of accepted principles of education, select and classify the political material which is available for practical efforts at a sounder social structure through the instruction of the youth, and attempt to formulate a programme.

299. Thesis for the Master's Degree. The STAFF

Digitized by Google

PUBLIC HEALTH

Instruction in the subjects which form the three curricula leading to the degree of Graduate in Public Health, as outlined in the Circular of Information, Academic Departments, is given in the departments listed below. For details regarding courses of instruction the student is referred to the announcements of the departments concerned, and to the Committee on Public Health Study-Lists.

Departments in Berkeley

Agriculture (Entomology, Veterinary Science), Anatomy, Biochemistry, Civil Engineering, Economics, Home Economics, Hygiene, Pathology and Bacteriology, Physiology, and Zoology.

Departments of the Medical School in San Francisco

Clinical Neurology, Dermatology, Laryngology, Legal Medicine, Medicine, Ophthalmology, Orthopedic Surgery, Pediatrics, Surgery, and Urology.

Committee on Public Health Study-Lists

Legge (chairman), Force, Gay, Hyde, Musgrave, and Miss Stebbins.

Digitized by Google

PUBLIC SPEAKING

MARTIN C. FLAHERTY, Ph.B., Professor of Forensics.

CHARLES D. VON NEUMAYER, Associate Professor of Public Speaking and Dramatic Art.

DWIGHT E. WATKINS, M.A., Assistant Professor of Public Speaking.

GEORGE BOAS, Ph.D., Assistant Professor of Forensics.

ANNIE H. ALLEN, M.A., Associate in Public Speaking.

CAROLINE DUNCAN, Associate in Public Speaking.

LOUISE A. PATTEN, A. B., Associate in Public Speaking.

RAY VANDERVOORT, A.B., Teaching Fellow in Public Speaking.

HARRY A. MAZZERA, A.B., Teaching Fellow in Public Speaking.

GLADYS E. MURPHY, A.B., Teaching Fellow in Public Speaking.

FLORENCE E. LUTZ, Lecturer in Voice Culture.

The courses in public speaking fall into two well defined groups: (*a*) oral expression and dramatic art, (*b*) the principles of logical discourse—expository and argumentative.

(*a*) *Oral Expression and Dramatic Art.* In this group come such courses as those in voice culture, oral interpretation, and the elements of the art of acting. The group taken as a whole aims at effective oral expression, and proceeds upon the assumption that oral interpretation is based upon clear thinking.

(*b*) *Logical Discourse—Expository and Argumentative.* Under this heading are grouped the courses covering the lo[illegible] [illegible]d rhetorical bases of those forms of discourse that are primarily addressed to the intellect. The field covered includes study of methods of investigation, analysis, briefing, the testing of evidence, and practice in oral presentation.

Generally speaking, students may choose courses in either group, or in both, but those students who elect public speaking for their major study are required so to arrange their courses as to cover the fundamentals in both phases of the work before taking advanced studies in their special field. It is hoped that by a combination of both kinds of work a foundation may be laid which will prove valuable, not only to teachers of oral English in the high schools, but to all those who are preparing for professional careers in which the clear and orderly presentation of thought, orally, plays an important part.

PREPARATION FOR THE MAJOR

The prerequisites to courses in the upper division are Public Speaking 1A–1B, and 2A–2B. English 1A–1B will be accepted as the equivalent of Public Speaking 1A–1B.

Honors-students.—Candidates for honors in public speaking must prepare a programme at the beginning of their candidacy after consultation

Digitized by Google

with a committee of the department appointed to supervise their work. No student will be advanced to the honors status who cannot satisfy the requirement for advanced standing in English. This requirement in English will be relaxed in favor of students who have taken equivalent work in Latin or in Greek.

In no case will a student be admitted to candidacy for honors in public speaking who has not completed with credit all the lower division courses which he has taken in the department. Each student so admitted will be required to undertake a certain amount of work under a designated instructor who will act as the student's adviser in matters relating to his programme.

Lower Division Courses

1A–1B. Elements of Public Speaking. (3–3) Yr.
Flaherty, Watkins, Boas, Vandervoort, Mazzera

Eight sections, M W F, 9, 10, 1, 2, 3; Tu Th S, 11. Training in fundamental processes; organization and arrangement of material; outlining; practice in the construction and delivery of type forms of speech.

2A–2B. Elements of Expression and Interpretation. (3–3) Yr.
Allen, Duncan, Patten

Four sections, M W F, 9, 3; Tu Th S, 8, 9.

A study of the laws governing correct voice production. The essentials of effective oral interpretation. Practice in reading and speaking.

4A–4B. Vocal Expression. (2–2) Yr. von Neumayer

Two sections, Tu Th, 9, 10.

Drill in elocution, reading, and the declamation of original addresses.

5A–5B. Principles of Argumentation. (3–3) Yr.
Flaherty, Watkins, Boas

Three sections, M W F, 10; Tu Th S, 11. Prerequisite: course 1A–1B.

The phrasing of propositions, analysis, brief-drawing, the nature and kinds of evidence, persuasion, practice in addressing audiences.

10A–10B. Dramatic Interpretation. (3–3) Yr. M, 1–3, W, 2.
von Neumayer

A course adapted to the needs of beginners and designed as a systematic introduction to more advanced dramatic work. It aims to cover the elements of acting: diction, poise, reading, pantomime, character portrayal, etc. Limited to twenty.

Upper Division Courses

105A–105B. Masterpieces of Legal and Political Argument. (2–2) Yr.
Tu Th, 3. Boas

Analysis of selected argumentative speeches and writings of such men as Hamilton, Marshall, Lincoln, Douglas, Webster, Holmes, and Wilson. Open to students who have had some training in logic, history, economics, law, or kindred subjects. Permission of the instructor must be secured.

Digitized by Google

107A–107B. Reading and Speaking. (3–3) Yr.
VON NEUMAYER, LUTZ, ALLEN

Three sections: M W F, 8, 9; Tu Th S, 10.

Training in oral expression; a study of the fundamental principles of effective reading and speaking. Planned especially to meet the needs of candidates for the teacher's recommendation.

109A–109B. The Cultivation of the Speaking Voice. (3–3) Yr. ALLEN
Tu Th S, 8.

A scientific study of the laws governing voice production. The elimination of interference and fatigue.

110A–110B. Third-year Public Speaking. (3–3) Yr. FLAHERTY
W, 4–6, F, 4. Prerequisite: course 5A–5B and some preliminary training in vocal expression.

(A) Oral Argumentation and Debate. Preparation of briefs; presentation of arguments. (B) Practice in extempore speaking; the preparation of the occasional address. Open to students selected from 110A.

111A–111B. Expression and Interpretation. (3–3) Yr. LUTZ, DUNCAN
Prerequisite: 2A–2B.

Three sections: Tu Th S, 9, 10; M W F, 4.

116A–116B. Advanced Training for Students who are Preparing for Public Platform Work. (3–3) Yr. Two sections: M W F, 3, 4. LUTZ
Prerequisite: 111A–111B.

118A–118B. Art of Acting: Theory and Practice. (3–3) Yr. Two sections: M W F, 11, 3. VON NEUMAYER

The psychology of acting; the cultivation and development of the dramatic instinct through character portrayal. Study and presentation of selected one-act plays. Open to all students who have the permission of instructor.

GRADUATE COURSES

200A–200B. Practical Bibliography. (2–2) Yr. FLAHERTY

A course designed to meet the needs of prospective teachers of debating.

*210A–210B. Advanced Public Speaking. (3–3) Yr. FLAHERTY
M W F, 4.

Open to qualified seniors and to graduates.

300A–300B. The Teaching of Public Speaking. (3–3) Yr. ALLEN
Tu Th, 9, and a third hour.

A study of the problems connected with the teaching of oral English in the high schools. Discussion and criticism of school-texts.

* To be given 1921–22.

Digitized by Google

SANSKRIT

ARTHUR W. RYDER, Ph.D., Associate Professor of Sanskrit.

SANSKRIT LITERATURE

Lecture Courses

Courses 20 and 21 do not require a knowledge of any Indian language, and are open to all students except freshmen. Together, they aim to give an outline history of Sanskrit literature, but either one of them may be taken independently.

20. The Veda and the Philosophical Systems. (2) I. Tu Th, 11. RYDER
Lectures and reading. An outline of Vedic literature; the earlier forms of Brahmanism; the development of ritualism and philosophy; the revolt which found expression in Buddhism and Jainiism, the struggle between Brahmanism and Buddhism, and the rise of Hinduism.

21. Classical Sanskrit Literature. (2) II. Tu Th, 11. RYDER
Lectures and reading. Outline of the great epics and of the classical literature, including drama: The Mahābhārata, the Rāmāyana; the Kāvya's (minor epics); lyric and elegaic poetry; novels and romances; fables and epigrams; the law books; rhetoric and poetics; scientific literature.

UPPER DIVISION COURSES

Language Courses

101A–101B. Elementary Sanskrit. (3–3) Yr. RYDER
M W, 11, and a third hour.
Perry's Primer, Whitney's Grammar, Lanman's Reader. Grammar, Composition, and reading.

102A–102B. Second-Year Sanskrit. (3–3) Yr. RYDER
Rapid reading of classical texts: the fables of the Hitopadeça, selections from the Kathāsaritsāgara and Daçakumāracarita.

*103A–103B. Advanced Classical Sanskrit. (3–3) Yr. RYDER
(A) Reading of more difficult texts and study of their position in the literature: the Epigrams of Bhartrihari; the Meghadūta of Kālidāsa. (B) Introduction to the drama and to the Prākrit languages: the Çakuntalū of Kālidāsa; the Mricchakatika of Çūdraka.
The reading matter of courses 102A–102B and 103A–103B may be varied in accordance with the tastes and purposes of the students.

199A–199B. Special Study. (2) Yr.

GRADUATE COURSE

*220. The Veda and the Philosophical Systems. (4) I. RYDER
An expansion of course 20, with added reading and the preparation of a thesis.

---

* Not to be given, 1920–21.

Digitized by Google

SEMITIC LANGUAGES

WILLIAM POPPER, Ph.D., Associate Professor of Semitic Languages.
MARTIN A. MEYER, Ph.D., Lecturer in Semitic Languages and Literature.

Courses in French or German are recommended as preparation for major work in this department.

Language Courses

The specific courses given in any year, the hours therefor, and the authors read, will depend upon the needs of the students. All courses except elementary courses may be repeated without duplication of credit and by agreement may be counted as graduate work; all are year courses, and open to any qualified student; excepting course 107A–107B, they will be given by Mr. Popper.

Hebrew. Elementary (3A–3B, 3 hrs.); Second Year (104A 104B, 2 hrs.); Exegetical (206A–206B, 2 hrs.); Mishnaic (107A–107B, 1 hr., MEYER); Medieval (207A–207B, 2 hrs.).

Arabic. Elementary (113A–113B, 2 hrs.); Prose (214A–214B, 2 hrs.); Koran and Poetry (215A–215B, 2 hrs.).

Syriac. Elementary (111A–111B, 2 hrs.); Advanced (212A–212B, 2 hrs.).

Seminar (220A–220B, 2 hrs.).

Lecture Courses

Elective courses not requiring a knowledge of any Semitic language.

6A–6B. Biblical Archaeology. (1–1) Yr. Tu, 1. MEYER
Given alternately with Semitics 7.

*7A–7B. History of the Hebrew Religion. (1–1) Yr. Tu, 1. MEYER

8A–8B. Second Hebrew Commonwealth. (1–1) Yr. Tu, 2. MEYER
The history and literature of the Hebrews in Palestine after the return from the captivity (536 B.C.).

*9A–9B. The Diaspora. (1–1) Yr. Tu, 3. MEYER
The life and letters of the Jews after the fall of Jerusalem (70–1492 A.D.).
Given alternately with Semitics 10A–10B.

10A–10B. Modern Jewish History. (1–1) Yr. Tu, 3. MEYER

25. Mohammedanism. (2) Either half-year. Tu Th, 11. POPPER

* Not to be given, 1920–21.

Digitized by Google

SLAVIC LANGUAGES

GEORGE R. NOYES, Ph.D., Professor of Slavic Languages.
MILUTIN KRUNICH, Instructor in Serbo-Croatian and French.
ALEXANDER S. KAUN, M.A., Associate in Russian.

Equipment.—The University Library contains ample material for the advanced study of Russian literature and philology and for the comparative study of the Slavic languages. It also gives an opportunity for wide reading in Polish, Bohemian, Serbo-Croatian, and Bulgarian.

Prerequisites.—There are no definite prerequisites for upper division work in the Department of Slavic Languages: that is, any student of the upper division may at once take courses of upper division grade in the department. It is even possible for students, by electing courses 130–133, 140, 150, to take a major in the department without the study of a Slavic language. For students intending to do serious work in Slavic languages some acquaintance with Latin or Greek is of more value than the knowledge of German or of a Romanic language.

Honors-students in the Upper Division.—Candidates for honors must do 24 units of upper division work in the department, of which at least 16 must be of first grade. The 24 units must include at least 18 units of work in one Slavic language and also either course 160, course 162 or (with the approval of the department), course 199.

Higher Degrees.—Candidates for the master's degree must show a general knowledge of the history of one Slavic literature, and must make a special study of one important Slavic author or literary type. Candidates for the doctor's degree with Slavic languages as a major must do work in at least three Slavic languages, of which one must be Old Church Slavic. Aside from the thesis, a detailed knowledge of the history of one Slavic literature is required, and an acquaintance with the comparative grammar of the Slavic languages.

Summer Session.—Lecture courses on Russian literature and other Slavic subjects are at times given in the Summer Session.

University Extension.—Class work in Russian and correspondence instruction in Russian and other Slavic languages is provided by the University Extension Division. This work may be counted towards university degrees under the usual conditions and may be used as preparation for more advanced work in residence.

LOWER DIVISION COURSES

1A–1B. Elementary Russian. (3–3) Yr. M W F, 1. NOYES

Bondar, Simplified Russian Method. Boyer and Speranski, Russian Reader. Practice in conversation.

Students taking this course are advised also to elect Russian 18A and 118B.

6A–6B. Elementary Polish. (3–3) Yr. NOYES

Freese, Polish Manual. Reading of easy Polish texts.

Digitized by Google

10A–10B. Elementary Serbo-Croatian. (3–3) Yr. M W F, 1. KRUNICH
Petrovitch, Servian Conversation-Grammar. Reading of easy texts.

14A–14B. Elementary Bohemian. (3–3) Yr. KAUN
Nigrin, Bohemian Grammar. Beneš, Česká čítanka.

Any one of the above four courses, with assigned readings in the history of Slavic literature, may be counted as work of the upper division, in which case students should register for 101A, 106A, 110A, etc.

18A. Elementary Russian Conversation and Reading. (2) I. KAUN
Tu Th, 1.

Solomonoff, First Steps in Russian. Practice in pronunciation and elementary conversation. Open only to students who are taking Russian 1A, for whom it is earnestly recommended.

ELECTIVE COURSES

These courses do not require a knowledge of any language other than English, and are open to all students except freshmen. By special arrangement with the instructor they may be taken as upper division courses. In such cases the students should register in courses 130, 131, 132, 133, 140, 150.

30. Russian Novelists and Dramatists of the Nineteenth Century. (3) I. M W F, 3. NOYES

Lectures and reading. Authors: especially Tolstoy; also Pushkin, Gogol, Turgenev, Dostoyevsky, Qstrovsky, and others.

31. Recent Russian Literature. (2) II. Tu Th, 3. KAUN

Lectures and reading. A study of important Russian writers later than Tolstoy: Chekhov, Korolenko, Merezhkovsky, Gorky, Andreyev, and others.

32. Polish and Bohemian Literature. (3) II. M W F, 3. NOYES

Lectures and reading. A brief account of the literature of Poland and Bohemia. A sketch of the history of the two countries, and of their connection with the European War, will precede the lectures on their literature.

33. The Serbian People. (2) II. Tu Th, 2. KRUNICH

Lectures and reading. A sketch of the history, manners and customs, and literature of the Serbian and Croatian peoples. Attention will be given to the part played by the South Slavs in the European War.

40. The Political Development of Modern Russian. (2) I. Tu Th, 10. KAUN

Lectures and reading. A study of political and social movements and institutions in Russia from about 1800 to the present day. Special attention will be paid to the history of Russian revolutionary movements since 1861.

Digitized by Google

50. Russian Commerce and Industry. (2) II. Tu Th, 10. KAUN

Lectures and reading. A study of economic conditions in Russia in the period just before the war, and, so far as is possible, at the present time. This course is designed to be useful to students in the College of Commerce.

UPPER DIVISION COURSES

102A–102B. Second-Year Russian. (3–3) Yr. M W F, 9. KAUN

Reading of selections from Turgenev, Chekhov, Lermontov, and Pushkin. Forbes, Russian Grammar. Practice in composition and conversation.

103A–103B. Third-Year Russian. (2–2) Yr. M F, 10. KAUN

Continuation of 102A–102B. Reading of Dostoyevsky and Andreyev, and of dramas by Gogol and Chekhov. Practice in composition and conversation.

104A–104B. Fourth-Year Russian. (2–2) Yr. Tu Th, 11. KAUN

Rapid reading of modern Russian prose and verse. Practice in composition and conversation.

105. Written Translation from Slavic Languages. (Maximum 3). Either half-year. NOYES

Practice in written translation of Slavic fiction or drama, with attention to English style. This course may be taken only in connection with other upper division work in the department.

107A–107B. Second-Year Polish. (2–2) Yr. Tu Th, 3. NOYES

Reading of Mickiewicz. Practice in composition.

111A–111B. Second-Year Serbo-Croatian. (3–3) Yr. M W F, 2. KRUNICH

Reading of Serbian popular ballads and of modern short stories. Practice in composition and conversation.

112A–112B. Advanced Serbo-Croatian. (1–1) Yr. KRUNICH

Reading of Serbian poetry. Practice in composition and conversation.

117A–117B. Advanced Bohemian. (2–2) Yr. Tu Th, 1. NOYES

Reading of Bílý and Čech, Malá slovesnost; Truhlář, Výbor z literatury české (doba nová); Grim, Výbor z literatury české (doba střední). Practice in composition.

118B. Easy Russian Reading. (2) II. Tu Th, 1. NOYES

Reading of Chekhov, Humorous Stories; Turgenev, Mumu; and other easy texts. Practice in conversation. This course is open only to students who are taking Russian 1B, for whom it is earnestly recommended.

121A–121B. Russian Composition and Conversation. (1–1) Yr. W, 10. Designed to accompany Russian 104A–104B. KAUN

Digitized by Google

Honors-Courses in Slavic Literature

160. The Life and Work of Leo Tolstoy. (5) I. M W F, 3. Noyes
Special assignments in connection with the work of course 30.

162. Polish Romanticism (5). II. M W F, 3. Noyes
Special assignments in connection with the work of course 32.

199. Honors Course. (Maximum 4) Either half-year. Noyes
Candidates for honors and graduate students will be offered opportunities for independent reading and study. Credit will not exceed four units a half-year.

Graduate Courses

208. Polish. Mickiewicz and other Poets. (3–3) Yr. Noyes
Reading of Mickiewicz and other Polish poets. Practice in written translation.

224. Old Church Slavic. (3) Either half-year. Noyes
Leskien, Handbuch der altbulgarischen Sprache and Grammatik der altbulgarischen Sprache. Study of the relations of Old Church Slavic to the other Indo-European languages.

225. Historical Russian Grammar. (2) I. Noyes
Prerequisite: course 224.
Reading of Buslayev, Russkaya hrestomatiya. Study of the development of the Russian language and of its relations to the other Slavic languages.

298. Individual Work. (Maximum 4) Either half-year. Noyes
Graduate students will be offered opportunities for independent reading and study. Credit will not exceed 4 units a half-year.

299. Thesis for the Master's Degree. Noyes

Digitized by Google

SOCIAL INSTITUTIONS

FREDERICK J. TEGGART, A.B., Associate Professor of Social Institutions.

LOWER DIVISION COURSE

1A–1B. Human Geography. (3–3) Yr. Tu Th S, 9. TEGGART

An introduction to the study of institutions, being an examination of the relations of geographical conditions to the development of western civilization.

UPPER DIVISION COURSES

101A–101B. Migrations. (2–2) Yr. Tu Th, 11. TEGGART

A study of the influence of migrations on institutions, and particularly on the development of the state and the ownership of property.

105A–105B. Special Study in the History of Institutions. (2–2) Yr. M W, 2. TEGGART

GRADUATE COURSES

201A–201B. Method in the Study of Institutions. (2–2) Yr. TEGGART Tu, 2–4.

A survey and critical study of the literature of institutions, with special reference to the problems of method.

202A–202B. Seminar. (2–2) Yr. Th, 2–4. TEGGART

Subject to be arranged.

These courses will be accepted for all purposes of university credit as anthropology in the Department of Anthropology, as economics in the Department of Economics, as philosophy in the Department of Philosophy, and as political science in the Department of Political Science.

Digitized by Google

SPANISH

RUDOLPH SCHEVILL, Ph.D., Professor of Spanish.
*S. GRISWOLD MORLEY, Ph.D., Associate Professor of Spanish.
CARLOS BRANSBY, M.A., Litt.D., Assistant Professor of Spanish.
ERASMO BUCETA, Doctor en Derecho, Assistant Professor of Spanish.
MALBONE W. GRAHAM, D.D., Instructor in Spanish.
BEATRICE Q. CORNISH, M.A., Associate in Spanish.

Staff of Assistants.

PREPARATION FOR THE MAJOR

Required: 16 units of lower division courses in Spanish; 6 units of some other Romanic language.

Recommended: Latin, History of Spain and Spanish Colonies; English; a modern language.

A. Elementary Spanish. (5) I. GRAHAM in charge
Fourteen sections, M Tu W Th F, 8, 9, 10, 1, 2, 3; M Tu W Th S, 11.

Stress is laid on accurate pronunciation, Castilian being the standard, on the essentials of grammar, and on careful translation into idiomatic English of simple Spanish prose. The equivalent of the high school course in elementary Spanish. Students who complete A after having one year of Spanish in the high schools will receive 2 units in addition to their matriculation credit.

B. Elementary Spanish. Continuation of A. (5). GRAHAM in charge.
Either half-year. Six sections: M Tu W Th F, 8, 9, 1, 2.
Prerequisite: course A or two years of high school Spanish.

Further study of grammar, especially syntax. Reading of contemporary Spanish prose, plays and some verse. Conversation and composition. The equivalent of the high school course in intermediate Spanish.

C. Intermediate Spanish. Continuation of B. (3) I. The STAFF
Five sections: M W F, 8, 9, 1, 2; Tu Th S, 8, 9.
Prerequisite: course B or three years of high school Spanish, or its equivalent, or a special examination.

A detailed study of syntax, dictation and memorizing of prose and verse; conversation; selections from modern texts. The equivalent of the high school course in advanced Spanish. Conducted chiefly in Spanish.

D. Intermediate Spanish. Continuation of C. (3) II. The STAFF
Six sections: M W F, 9, 1, 2; Tu Th S, 9.

* Absent on leave, 1920–21.

Digitized by Google

CD. Intermediate Spanish. Continuation of B. (5) II. The STAFF
Five sections: M Tu W Th F, 9, 1, 2.
Prerequisite: course C or four years of high school Spanish.

UPPER DIVISION COURSES

Required for the Major: 18–20 units of upper division courses, including 101A–101B, 106A–106B, 103A–103B or 105A–105B, 107A–107B, 108A–108B or 109A–109B.

A. *Primarily for Juniors*

101A–101B. Conversation and Composition. (3–3) Yr. BUCETA in charge
Six sections: M W F, 8, 9, 1, 2; Tu Th S, 8, 9. Enrollment limited to thirty students in each section.

Prerequisite: the equivalent of 16 lower division units. Two sections reserved for commercial and technical Spanish; open only to students in the College of Commerce.

Advanced written and oral expression. Students who enter the upper division must take 101A–101B.

103A–103B. The Nineteenth Century. (3–3) Yr. M W F, 9. SCHEVILL
Prerequisite: course C–D, or credit for the high school course in advanced Spanish, or its equivalent, or a special examination.

An outline of Spanish literature in the nineteenth century, with lectures and reading of representative authors. Limited to thirty students, admitted only by special permission of instructor.

B. *For Juniors and Seniors*

105A–105B. The Modern Drama. (2–2) Yr. Th S, 10. ——

A study of the chief plays of the most recent playwrights: Linares Rivas, Benavente, Galdós, the Quintero brothers, etc. Conducted mainly in Spanish. Limited to thirty students, admitted by special permission of the instructor.

106A–106B. Advanced Composition. (2–2) Yr. Tu Th, 11. BUCETA
Special course for teachers or candidates for the teacher's recommendation. Limited to fifteen students.

C. *Primarily for Seniors*

107A–107B. Survey of Spanish Literature to 1700. (2–2) Yr. SCHEVILL
Tu Th, 9.

A study of the principal writers with selections from their most important works; lectures; reports to be made by the students on work assigned. Students are admitted only by special permission of instructor. Both 107A and 107B are required of candidates for the teacher's recommendation with Spanish as a major.

108A–108B. The Novel of Spain and Spanish America. (3–3). Yr.
M W F, 2. BRANSBY

*109A–109B. The Drama of the Golden Age. (2–2) Yr. MORLEY
Tu Th, 8.

---

* Not to be given, 1920–21.

Digitized by Google

129A–129B. Special Study. (2–2) Yr. The STAFF
For students who wish to undertake special advanced work and to learn how to use the library.

136A–136B. History and Literature. (2–2) Yr. Tu Th, 1. JORALEMON

140A–140B. A General Introduction to the History of Speech. ——
For all students who specialize in languages.

GRADUATE COURSES

201A–201B. History of Spanish Poetry. (2–2) Yr. BUCETA

203A–203B. Cervantes. (2–2) Yr. Tu Th, 5. SCHEVILL

205A–205B. Masterpieces of the Golden Age. (2–2) Yr. F, 5. SCHEVILL

*208A–208B. The Spanish Ballad. (2–2) Yr. MORLEY
Given in alternate years.

229A–229B. Special Advanced Study. (2–2) Yr. SCHEVILL and the STAFF

299A–299B. Thesis for the Master's Degree. The STAFF

* Not to be given, 1920–21.

Digitized by Google

ZOOLOGY

CHARLES A. KOFOID, Ph.D., Sc.D., Professor of Zoology, and Assistant Director of the Scripps Institution for Biological Research.

WILLIAM E. RITTER, Ph.D., Professor of Zoology and Scientific Director of the Scripps Institution for Biological Research.

SAMUEL J. HOLMES, Ph.D., Professor of Zoology.

J. FRANK DANIEL, Ph.D., Professor of Zoology.

JOSEPH GRINNELL, Ph.D., Professor of Zoology and Director of the California Museum of Vertebrate Zoology.

JOSEPH A. LONG, Ph.D., Associate Professor of Embryology.

FRANKLIN P. REAGAN, Ph.D., Assistant Professor of Zoology.

CHARLES V. TAYLOR, Ph.D., Assistant Professor of Zoology.

JOHN F. KESSEL, B.S., Teaching Fellow.

SARAH ELKIN, M.S., Teaching Fellow.

AILEEN ANDREWS, A.B., Teaching Fellow.

ROBERT C. MILLER, A.B., Teaching Fellow.

HERBERT J. PACK, B.S., Teaching Fellow.

HELEN REDFIELD, A.B., Teaching Fellow.

RAYMOND M. SELLE, B.S., Teaching Fellow.

MARTHA THOMPSON, B.S., Teaching Fellow.

CLARENCE E. WALTON, A.B., Teaching Fellow.

WILLIAM F. HAMILTON, A.B., Assistant in Zoology (to Dec. 31, 1920).

TRACY I. STORER, M.S., Field Naturalist, California Museum of Vertebrate Zoology.

A deposit of $5 is required in courses 1A, 1B, 4, 106, 107, 109, 110C, 111C, 113, 116, 117A–117B, 118A–118B. $3 is retained as a fee and the balance after deductions for breakage may be returned.

PREPARATION FOR THE MAJOR

Required: Zoology 1A (4), 1B (5).

The courses are designed to meet the needs of various classes of students. For certain specific ends the following recommendations are made:

(1) Students who plan to specialize in zoology should complete courses 1A and 1B as early in their course as is feasible. These courses are prerequisite to upper division work, and, except as noted below, to all courses in the department. The following grouping of courses is recommended: (I) 106 or 107 or 103; (II) 110, 110C and 111, 111C; (III) 114 and 115; (IV) 112 and 113 or 116.

(2) For general students, courses 1A, 1B, 10, 103, 104, 107, 110, 110C, 111, 111C, 112, 113, 114 and 115.

Digitized by Google

(3) For students planning to study medicine, courses 1A, 1B, 4, 103, 106, 107, 110, 110C, 111, 111C, 114, 115.

(4) For non-biological students, courses 10, 104, 114, 115 and 116.

Students who plan to enter instruction or research in zoology as a profession should not only lay a broad foundation in the courses in zoology but should also include at least the fundamental courses in chemistry and physics in their course of study. Courses in bacteriology, botany, entomology, microscopic anatomy, palaeontology and physiology may be included to advantage, and a reading knowledge of French and German is essential. Research in biometrics requires a knowledge of higher mathematics (Mathematics 120) and statistical methods (Economics 140).

Honors-students in the Upper Division.—To honors-students whose major is zoology the department offers closer supervision of their work, larger facilities in material and equipment, and wider latitude in selection of subject-matter. Its purpose is to foster initiative and independent effort. Honors-students may select a member of the staff as adviser. Guidance in a selected course of reading will be afforded.

A major in zoology should include any two of the groups of courses listed under (1) above. The remainder of the 24 major units may include any upper division courses in zoology. Upper division courses in allied natural sciences will be accepted to the extent of 8 units when approved by the department.

Lower Division Courses

1A. General Zoology. (4) I.
Kofoid, Holmes, Taylor, Hamilton, and Teaching Fellows

Lectures: Sec. I, Tu Th, 9; Sec. 2, Tu Th, 10; laboratory: Sec. 1, M F, 1–3; Sec. 2, M F, 3–5; Sec. 3, Tu Th, 1–3; Sec. 4, Tu Th, 3–5; Sec. 5, W, 1–3, S, 8–10; Sec. 6, W, 3–5, S, 10–12; Sec. 7, Tu Th, 8–10; Sec. 8, Tu Th, 10–12; Sec. 9, M F, 8–10; Sec. 10, M W, 10–12.

An introduction to the facts and principles of animal biology with special reference to the structure, functions, and evolution of animal life. The laboratory exercises are essentially illustrative of lectures and are based on the examination of living and prepared specimens, supplemented by models and charts.

1B. General Zoology. (5) II. Daniel, Long, and Teaching Fellows

Lectures: Tu Th S, 11; laboratory: Sec. 1, Tu Th, 8–11; Sec. 2, Tu Th, 1–4; Sec. 3, W, 1–4, S, 8–11. Prerequisite: course 1A.

A continuation of course 1A. First half of semester: the behavior and structure of chordate types with special reference to the lower vertebrates (Daniel). Second half: the early development of animal types, especially the chick (Long).

4. Microscopical Technique. (2) II. W, 8–11, and 3 other hours.
Long, Hamilton

Prerequisite: course 1A and elementary chemistry.

Preparation of animal tissues for microscopical examination; use of microscope and microtome; methods of fixation, sectioning, and staining. Laboratory and reading.

Digitized by Google

10. General Biology. (3) II. HOLMES
Lectures, Tu Th, 8; conferences: Sec. 1, Th, 9; Sec. 2, F, 8; Sec. 3, F, 9; Sec. 4, S, 9.

An outline of the main facts and principles of animal biology with special reference to evolution, heredity, eugenics, and the bearing of biology upon human life. Lectures with demonstrations, conferences, assigned readings, and reports. Open without prerequisite to all students, but designed for those not specializing in zoology.

UPPER DIVISION COURSES

Courses 1A and 1B are prerequisite to courses 103, 106, 107.
Course 1A is prerequisite to courses 110, 110C, 111, 111C, 112, 113, 116.

103. Experimental Zoology. (2) I. Tu Th, 9. DANIEL
An experimental study of the fundamental properties of living substance, including its development, its growth and regeneration, and an application of the transplantation of living tissues.

104. Animal Behavior. (2) I. Tu Th, 4. HOLMES
The tropisms, instincts, and intelligence of animals, and the general evolution of the animal mind.

106. Comparative Anatomy of the Higher Vertebrates. (4) II. REAGAN
Lectures, Tu Th, 4; laboratory: Sec. 1, M F, 1–4; Sec. 2, Tu Th, 1–4.

Comparative study of organ-systems, organogeny, and structural relationships in the higher vertebrates as a basis for interpretation of the mammal. Regional dissection of a mammal, and sectional study of the foetal pig. Demonstrations of dissections of reptiles and birds. Students in Zoology 106 may take the lectures of Palaeontology 104 without the laboratory work (1 unit).

107. Cytology and Advanced Embryology. (4) I. LONG
Lectures, M W, 9; laboratory, M W, 1–4.

The structure and activities of the cell in development, in sex determination and heredity. The early development of mammals. Lectures, demonstrations, reading and reports, and laboratory work on special topics.

109. Biological Examination of Water. (1) II. F, 1–4. KOFOID
The biology of waters of reservoirs and streams, with special reference to water supply and sewage disposal. A field and laboratory course dealing with the microscopic organisms of fresh water, other than bacteria, their occurrence, distribution, and control, and their relation to problems of sanitary engineering. Prescribed, in the third year of the sanitary course, College of Civil Engineering. Open to students of household science.

110. Protozoology. (2) I. M W F, 8. KOFOID
Structure, life-history, and ecology of the protozoa with reference to the problems of biology; the relations of protozoa to disease in man and other animals. Reports on assigned topics. Students in public health and veterinary science with adequate biological training will also be admitted.

Digitized by Google

110c. Protozoology Laboratory. (2) I. M W F, 1–4. KOFOID
Course 110 should be taken concurrently.

111. General Parasitology. (2) II. KOFOID
Lectures: W F, 8; laboratory: Sec. 1, W, 1–4; Sec. 2, F, 1–4.

A general discussion of the relations of animals to the causation and transmission of disease, with special reference to the animal parasites of man and the domesticated animals; methods of biological prevention and control. Lectures and reports on assigned topics. Students of public health, and household, or veterinary science who have had adequate biological training will also be admitted.

111c. Morphology and Life History of Animal Parasites. (2) II.
W F, 1–4. KOFOID
Course 111 should be taken concurrently.

*112. Invertebrate Zoology. (3) I. REAGAN
Lectures, W, 9; laboratory, six hours.

The morphology, habitats, habits, and life-histories of the invertebrates, with special reference to local fauna, both marine and fresh-water. Lectures, reading, reports, and laboratory and field work.

113. General Vertebrate Zoology. (3) II. GRINNELL, STORER
Th, 1–5; S, 8–11.

Natural history of the birds, mammals, reptiles, amphibians and fishes; identification of species; study of habitat preferences, distribution, behavior and classification. Lectures, field, laboratory and museum work, with papers on assigned topics.

114. Heredity and Evolution. (3) I. M W F, 10. HOLMES

A discussion of the facts of heredity; Mendel's law and its applications; the development of theories of evolution since Darwin. Lectures and reports on assigned topics.

115. Eugenics. (2) II. Tu Th, 11. HOLMES

A consideration of topics in human heredity and eugenics. Lectures, assigned reading and reports. Prerequisite: course 114 or its equivalent.

116. Economic Vertebrate Zoology. (3) I. GRINNELL, STORER
Th, 1–5; S, 8–11.

The relations of mammals, birds, and reptiles of California to human affairs; changes due to the settlement of the country; important useful and injurious species; methods of encouragement and control. Special emphasis on ground squirrel, pocket gopher, fur-bearing mammals, game birds and mammals. Lectures, museum and field work, and assigned papers.

117A–117B. Special Undergraduate Study. The STAFF

All work supplementary to courses above. Credit to be fixed in each case.

---

* Not to be given, 1920–21

Digitized by Google

118A–118B. Advanced Undergraduate Work in the Subject Matter of any of the above upper division courses, excepting Course 117A–117B. The STAFF

119A–119B. Extra Session Work. The STAFF

Work on assigned topics carried on in Berkeley when the University is not in session, or in the field, or at the seashore under the direction of a member of the staff.

199. Honors Course for Seniors. (2) Either half-year. The STAFF

The reading of fundamental books in zoology.

GRADUATE COURSES

221A–221B. Seminar. History of Biological Thought. (1). The STAFF
W, 4–6.

224A–224B. Research. The STAFF

Original study on special topics, in the field, laboratory, and museum. The work may be carried on in the laboratories at Berkeley or at the San Diego station at any season of the year.

240. Seminar in Protozoology. (1) II. F, 4–6. KOFOID

299. Thesis for the Master's Degree. The STAFF

*300. Teachers' Course. (1) I. M, 11. HOLMES

Aims, methods, and subject matter of zoological instruction in the schools.

---

* Not to be given, 1920–21.

Digitized by Google

INDEX

Abbreviations, 4.
Accounting, 69, 73, 74, 75.
Advertising, 73.
Aerodynamics, 165.
Agriculture, 5.
Agricultural Chemistry, 9.
Agricultural Education, 10.
Agronomy, 11.
Anatomy, 31.
Animal Husbandry, 13.
Anthropology, 34.
Apiculture, 15.
Arabic, 220.
Archaeology, 150, 154.
Architecture, 36.
Argumentation, 217.
Art, 62.
Astronomy, 39.
Bacteriology, 27, 187.
Biochemistry, 44.
Biology (see under Zoology, Physiology, and Botany).
Bohemian, 222, 223.
Botany, 46.
Celtic, 50.
Chemistry, 51.
Chinese, 183–186.
Citriculture, 13.
Civil Engineering, 56.
Classification and numbering of courses, 4.
Credit valuation of courses, 4.
Criminology, 145, 147.
Dairy Industry, 14.
Debating, 218.
Dietetics, 133, 134.
Drawing, 62.
Economics, 67.
Education, 76.
Electrical Engineering, 166.
Engineering Drawing, 62.
English, 83.
Entomology and Parasitology, 15.
Ethnography, 34, 35.
Explanatory Note, 4.
Farm Management, 16.
Farm Mechanics, 17.
Finance, 74.
Floriculture, 20.
Foods, 133, 134.
Forestry, 17.
French, 94.
Fruit Products, 29.
Genetics, 19.
Geography, 99.
Geology, 103.
German, 108.
Germanic Philology, 113.
Gothic, 113.
Graphic Art, 64.
Greek, 114.
Hebrew, 220.
History, 119.
Home Economics, 125.
Household Art, 126.
Household Science, 132.
Hygiene, 136.
Irrigation Practice, 20.
Insurance, 74.
Irish, 50,
Irrigation, 20, 139.
Italian, 141.
Japanese, 183, 185.
Jurisprudence, 142.
Landscape Gardening and Floriculture, 20.
Latin, 148.
Law, 142.
Library Science, 155.
Marine Engineering, 168.
Mathematics, 157.
Mechanical and Electrical Engineering, 162.
Medical School, 169.
Metallurgy, 173, 176.
Military Science and Tactics, 170.
Mineralogy, 103, 106.
Mining and Metallurgy, 173.
Music, 179.
Naval Architecture, 168.
Norse, 113.
Numbering of courses, 4.
Nutrition, 21.
Olericulture, 23.
Oriental Languages, 183.
Palaeontology, 186.
Parasitology 15.
Pathology 187.
Petroleum Engineering, 175.
Pharmacology, 44.
Philosophy, 190.
Physical Education for Men, 196.
Physical Education for Women, 201.
Physics, 204.
Physiology, 210.
Plant Pathology, 23.
Polish, 221.
Political Science, 211.
Pomology, 24.
Poultry Husbandry, 26.
Prerequisites, 4.
Psychology, 190, 193.
Public Health, 215.
Public Speaking, 216.
Romanic Languages, (see under French, Italian, Spanish).
Rural Institutions, 26.
Russian, 221.
Sanitary Engineering, 60, 61.
Sanskrit, 219.
Semitic Languages, 220.
Serbo-Croatian, 222, 223.
Slavic Languages, 221.
Social Institutions, 225.
Sociology, 70, 71, 72.
Soil Chemistry and Bacteriology, 27.
Soil Technology, 28.
Spanish, 226.
Statistics and Insurance, 70, 71.
Surveying, 56, 57.
Teachers' Courses, 4.
Textiles. 129.
Transportation and Foreign Trade, 75.
Upper Division Courses, 4.
Veterinary Science, 29.
Viticulture and Fruit Products, 29.
Vocational Education, 79.
Welsh, 50.
Zoology, 229.

Digitized by Google

Digitized by Google

Digitized by Google